The Trot

A Review of the Hardware, Iron and Metal Trades.

Published every Thursday Morning by David Williams, No. 83 Reade Street, New York. Entered at the Post Office, New York, as Second-Class Matter.

Vol. XXXI: No. 19.

New York, Thursday, May 10, 1883.

\$4.50 a Year, Including Postage. Single Copies, Ten Cents.

Chain-Saw Mortising Machine.

We present in the accompanying engrav-We present in the accompanying engraving a new mortising machine now being turned out by the National Mortising Machine Co., of Chicago, Ill. So far as the general arrangement and the working of the machine is concerned, little perhaps need be said, the engraving giving all necessary explanation. Motion is transmitted from the main driving-shaft to the horizontal shaft received with two pulleys shown at the left. provided with two pulleys, shown at the loft of the engraving, and this in turn transmits it to a vertical shaft by means of bevel gears. At the upper end of this vertical shaft the At the upper end of this vertical shaft the power is again given off to a smaller horizontal shaft which operates the chain-saw. The the right of the machine, as shown, while a counter-weight mounted on the end of a lever balances the weight of the sliding mechanism at the top of the frame. The whole machine is simple in construction, and yields very satisfactory results. It finishes and cleans the mortise as it makes it, and works very well in soft or hard wood through knots. cleans the mortise as it makes it, and works very well in soft or hard wood through knots and shakes without splitting. There is, moreover, little vibration attending its use, and it may therefore be employed even in frail buildings. The machine shown in the engraving is the largest turned out by the company, and is especially adapted to the wants of car-builders and others. An automatic hub attachment is furnished with the machine, and can be easily removed and the machine readily adjusted to any other form or kind of work. adjusted to any other form or kind of work. adjusted to any other form or kind of work. It has a very wide range of mortising, and the great rapidity with which it will work in every kind of wood, and the satisfactory character of the work turned out, make it especially valuable to railroad-car shops and wood workers in general. The machines are being built for the company by the Union Foundry and Pullman Car Wheel Co., of Pullman, Ill., and they are now preparing to exhibit the perfect working and great scope of their machines at the forthe ming Na-tional Exposition of Railway Appliances, at Chicago. The company also make a smaller chicago. The company are state a state and a medium-size machine, for general use it planing mills, furniture factories and in all wood-working establishments. The prices range from \$200 for the smallest machine to \$500 for the one here illustrated.

fron Made from Magnetic Sand by the Siemens Direct Process,

BY W. J. MENZIES.

Attention has lately been turned to the Attention has lately been turned to such magnetic iron-sand deposits which exist in some places on the seacoast in large quantities, especially in Canada, on the banks of ties, espec ally in Canada, on the banks of the St. Lawrence River, though generally on the upper portions of the river, so mixed with ordinary sand as to be with difficulty separated from it. Lower down the river, how ever, the deposits are more extensive and purer. At Moisic, near the Bay of Seven Islands, according to the geological report of Canada, there is a continuous broad belt of iron-sand on the surface of the beach, containing equal to 55 per cent. of metallic hon, with, at the same time, a total absence of phosphorus and sulphur. The separation of these magnetic sands from all their imparities has recently been accomplished by an invention of Mr. Edison. His machine is simply a hopper fixed at an elevation, and so arranged as to allow the magnetic sand it contains to fall from a long, narrow opening at the bott m of it, in a thin, continuous stream. Electrical magnets are placed at right angles to this stream, and so arranged as to simply deflect the grains of magnetic iron falling. without allowing them to come in contact with the magnets. By this method the mage iron falls into a receptacle on one side while the impurities, consisting of sand, &c fall in a straight line, and are thus separated Mr. Edison has quite recently perfected this separator, causing it to separate within I per cent. of inpurity when working on a rich sand, and passing through 70 tons per day of o hours, with a 3-horse-power engine neces eary to drive the dynamo and elevate to the hopper. In this way an almost practically pure magnetic iron oxide is obtained, or an containing 72 parts of metallic iron

ombined with 28 parts of oxygen.
Doctor Siemens perceived that this pure aguetic iron in a fine state of division was eculiarly well suited for the direct process his rotator. Some tons accordingly were blained from Moisic, and worked in the ator belonging to the Landore Siemens sel Co., at Swansea, England, with the following results: After a few charges to ascertain the best mixture and most suitable emperature for working the material in the otator, it appeared that a charge of 25 cwt. magnetic iron-sand, mixed with 6 cwt. of mall coal or charcoal, gave the best results. The time required, from the first charging the furnace te withdrawing the rough The yield in the case of the small coal charges was about 18 cwt. of rough balls; in the case of the charcoal charges omewhat less, or about 16 cwt.; the difference in weight, probably to some extent, being accounted for by the impurities in the coal and less perfect decomposition, as compared with the charges made with charcoal. The charge usually came out in six or seven balls, some of these weighing over 3 gws., and were mostly at once thrown, while redhot, into the Siemens-Martin steel furnaces, and used for making mild steel, for which purposes they were found to be peculiarly suitable. One of the balls, however, from a charge made with coal, was roughly ham mered into a billet, which on analysis gave

Probably the small quantity of sulphur and phosphorus contained in the above sam-ple was combined with the slag, and would be got rid of by working the billet in the

usual manner,
One of the billets from a charge made

to pay the damage, claiming that according to their regulations the package must bear able depression in the Cumberland district, it is probable that stocks there have increased to some extent. It might be expected that the State, being under such circumstances a carrier that receives and the low prices now ruling there would goods in proper condition, and is paid for conveying the same, must deliver them in an equally proper condition, and the fact.

On April v there were see a secretary that according to their regulations the package must bear able depression in the Cumberland district, it is probable that stocks there have increased to some extent. It might be expected that with such a falling off in exports and the low prices now ruling there would be a manifest stoppage of production. So far, there is but there has been considerable to their regulations the package must bear able depression in the Cumberland district, it is probable that stocks there have increased to some extent. It might be expected that with such a falling off in exports and the low prices now ruling there would be a manifest stoppage of production. So far, there have increased to some extent. It might be expected that with such a falling off in exports and the low prices now ruling there would be a manifest stoppage of production. So far, there is but little evidence of this. an equally proper condition, and the fact that the party to whom the goods were sent having made no remark when they were de-livered does not by any means diminish the railway company's responsibility.

Prospects in the British Iron Trade.

be a manifest stoppage of production. So far there is but little evidence of this. On April 1 there were 553 furnaces in blast. The average number of furnaces in blast last year was 566: the reduction, there-fo e, is only about 2 per cent., which, on the production of last year, would be equal to about 170,000 tons per annum. The total exports to the end of March were 878,835

lubricating railway axles. The fact that an ordinary axle presents difficulties in the way of keeping it cool is often surprising to en-gineers unacquainted with the conditions un-der which lubrication is attempted. The load upon an axle is rarely sufficient to cause any great difficulty if journal and boxes could properly and continuously be oiled and kept free from grit. The great difficulty, and one that it seems is almost unsurmountable, is the open back of the box. It is this open back that necessitates the use of cotton waste for packing, for if this opening could be closed oil-tight, practically all that would be necessary to insure perfect lubrication would be to put a small amount of oil into the box itself without any packing whatever. Several years ago one of the leading car-builders in this country built a journal box which was tight at the back end, and he found, much to his surprise, that the motion of the car was sufficient to throw a deluge of oil over the journal, top of the brass and inside of the box as soon as the speed passed four or five miles per hour. A history of the devices that have been successfully used for ciling would be highly in-teresting, and when written will form one of the most instructive chapters in the history of mechanical progress. Looking at the prog-ress that has been made within the last 10 years, it seems very likely that further im-provements in the journal boxes will come only as increased care in fitting is introduced.

Grading Pig Iron by Grain.

An interesting circumstance which demonstrates the possible error arising from grading pig iron by fracture has been investigated by Mr. Ernst Sjosdedt, chemist of the Shelby Iron Co., Alabama. The Journal of the United States Association of Charcoal Iron Workers, in referring to the matter, says that a lot of iron had been selected by the grain only, and graded as numbers 1, 2 and 3. When remelted and chill tests taken from it, the No. 2 iron showed a deeper chill than either No. 1 or No. 3, and deep enough

for a No. 5 iron.

The practice at Shelby Iron Works is to grade all car-wheel iron by the chill plate,

as follows:
Grades of Car-Wheel Iron.—Nos. 1 and 2 show no chill in pig; No. 3 chills ¼ inch; No. 4 chills ¼ inch; No. 5 chills ¼ to 1 inch with the air chill; No. 6 mottled; No. 7 white; iron also

is assorted by grain.

Foundry Iron.—No. 1 X, very open grain and soft; No. 1, open grain and soft; No. 2, medium grain; No. 3, close dark

gray.
Mr. Sjosdedt made partial analyses of the pig iron of each grade, and the chill tests taken from them are as follows:

No. I pig iron contains 1.042 per cent. silicon; the chill test, 1.040 per cent. silicon.

per cent. silicon.

No. 2 pig iron, .5-1 per cent. silicon and
.612 manganese; chill test (a), .486 per cent.
silicon and .576 manganese; chill test (b),
.495 per cent. silicon and .535 manganese.
No. 3 pig iron, .920 per cent. silicon and
.540 manganese; the chill test, .749 per
cent. silicon.

cent. silicon. What was graded as No. 2 pig iron, there-What was graded as No. 2 pig fron, therefore, corresponded in its chemical constituents with a Shelby No. 5 (the average amount of silicon of which is .65 to .45 per cent.), and, as the manganese is neither uncent.), and, as the manganese is neither un-usually too high nor too low, and the surface of the pig has all the appearances of a high grade iron (being much more honeycombed than sample No. 3), the fact of its high chill

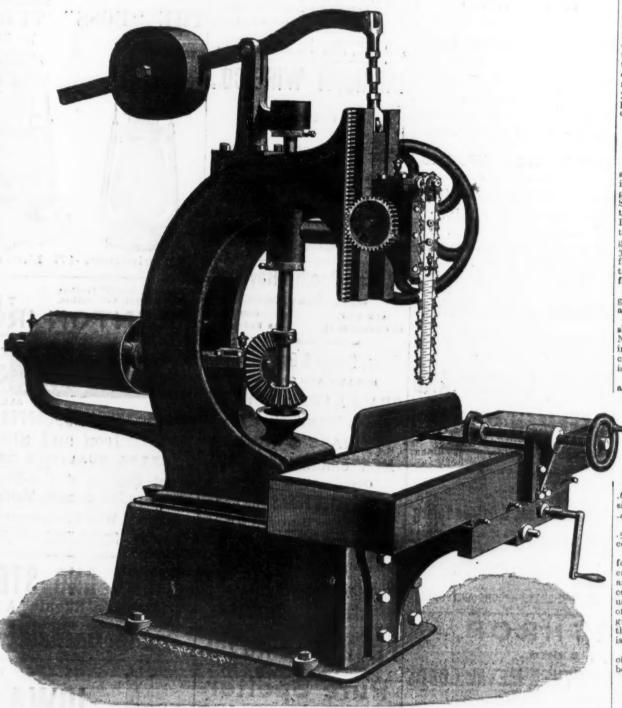
is quite natural. The No. 2 pig iron was selected on account of its open grain, it showing a fracture

The Trade-Mark Treaty With Spain.

The new trade-mark treaty between the United States and Spain, which has just been proclaimed by the President, is of much practical interest to smokers as well as cigar makers and dealers. It is a well-known fact that Cuban trade-marks have been extensively pirated in this country, and that cneap domestic cigars have been sold by the million under well-known Havana brands. The new treaty extends to Spanish subjects all the protection accorded by law to foreign trade-marks in the United States. The protection given by statute is that provided by the act of Congress of March, 1881. Under this act and the new treaty, any Spanish or Cuban manufacturer may register his trade-mark by paying a fee of \$25, which gives him the right to sue for dam-ages "any person who shall reproduce, ages "any person who shall reproduce counterfeit or colorably imitate" the megistered trade-mark, and also to stop it unlicensed use by injunction. As the only remedies here given are an action for damages any sudden or remarkable expansion in this direction can scarcely be looked forward to.

The figures submitted are as follows:

Citizens, are entitled to these remedies by citizens, are entitled to these remedies by the common law, independently of any stat-ute or treaty, it does not appear that Cuban of the treaty, any very important rights or substantial privileges which they did not



CHAIN-SAW MORTISING MACHINE, BUILT BY THE NATIONAL MORTISING MACHINE CO., CHICAGO, ILL.

would produce six charges daily, giving 5 tons per day of rough puddled balls, or, say, 30 tons per week of shingled blooms. The fuel used for the gas generator for heating the furnace comes to as near as possible one ton per ton of puddled balls, and the wages, when working the rotators in pairs, with proper mechanical elevators for charging the furnaces would in England be about per ton of rough puddled balls produced.

From these experiments it would appear that the difficulties hitherto experienced with Doctor Siemens's rotatory furnaces have been overcome by the use of pure magnetic iron-sand, which probably will be largely used. Absence of phosphorus and sulphur from this magnetic iron-sand also certainly promises well for the quality of iron and steel produced from it.

A somewhat interesting lawsuit was re-

67/ 1881. 52/9 Tons. Tons. 1,162,459 1,198 683

first three months being only 159,577 tons, against 331,206 tons during the same time in 1882. In consequence of this the price of Scotch pig-iron warrants has receded to 46/10½. Stocks, as might have been ex-46/1014. Stocks, as might have been expected, have increased during the period of reduced shipments. The only official returns A somewhat interesting lawsuit was recently tried at Antwerp, a glass manufactured at Antwerp, a gl are those published in the Middlesborough district; but, according to these, stocks in

found to be 31 5 tons per square inch, with which were felt in all departments mainly nine weeks' consumption and export.

23 per cent. of elongation. to the great falling off in shipments to the would appear, therefore, from the forego These have been an important part of elongation.

From these statistics it would appear that when working with pure magnetic iron-sand each of Doctor Siemens's rotatory furnaces past, and the contraction and expansion greatly extended, the production of pig iron, would produce six charges daily, giving 5 been reflected in the movement of prices.

These have been an important trade with other countries is greatly extended, the production of pig iron, if maintained on the present scale, is likely to be in excess of current requirements.

What, then, are the prospects? As regards or British trade with other countries is the American trade, it is quite certain that until July 1 (when the new tariff comes into operation) shipments will be curtailed as much as possible, and it is considered very doubtful if there will be any great extension of British trade in consequence of the reduc-tions which have been made in the tariff.

As regards trade with countries other than the United States, the Board of Trade returns show a very satisfactory development during the last two years, and for this reason

ANSONIA

BRASS & COPPER CO.,

No. 19 Cliff Street. MANUFACTURERS OF

BRASS AND COPPER

Sheets, Bolts, Rods, Wire, &c. Seamless Brass & Copper Tubing.

Ansonia Corrugated Stove Platforms. PURE COPPER WIRE Electrical Purposes, Bare and Covered. Phosphor Bronze Rods for Pumps, &c.

ANSONIA REFINED INCOT COPPER.

PHELPS, DODGE & CO., IMPORTERS OF

TIN PLATE.

ROOFING PLATE,

Sheet Iron Copper, Pig Tin, Wire, Zinc, &c. MANUFACTURERS OF

COPPER AND BRASS CLIFF STREET, NEW YORK.

SCOVILL MFG CO

BRASS, HINCES WIRE, CERMAN SILVER.

PHOTOGRAPHIC GOODS.

BUTTONS,

CLOTH AND METAL. FACTORIES, DEPOTS.

419 & 421 Broome St., N. Y. 177 Devonshire St., Boston. 183 Lake St., Chicago.

Waterbury, Conn. New Haven, Conn. New York City.

DICKERSON, VAN DUSEN & CO., Importers of

Tin Plate, Pig Tin, Sheet Iron, Capper, Wire, Zinc, Etc.

29 & 31 Cliff St., cor. Fulton, NEW YORK. DICHERSON & CO., Liverpool.

THE NEW HAVEN COPPER CO.,

SOLE MAKERS OF

POLISHED COPPER

ALSO MANUFACTURERS AND DEALERS IN

BRAZIERS & SHEATHING COPPER

Kettles, Bottoms, Bolts, Circles, &c.

290 Pearl Street - NEW YORK. GERMAN SILVER SPOONS AND FORKS.

Waterbury Brass Co.

CAPITAL, \$400,000. Sheet, Roll and Platers' Brass, CERMAN SILVER,

Copper, Brass and German Silver Wire, BRASS AND COPPER TUBING, COPPER RIVETS AND BURS,

BRASS KETTLES, Door Rail, Brass Tags, PERCUSSION CAPS,

POWDER FLASKS,

Metallic Eyelets, Shot Pouches, Tape Measures, &c. And small Brass War-s of every Description. Cartridge Metal in Sheets or Shells a Specialty. Sole Agents for the

Capewell Mfg. Co.'s Line of Sporting Goods. DEPOTS,

296 Broadway, New York, WATERBURY, 125 Eddy St., Providence, R. I.

Detroit Copper & Brass Rolling Mills.

BRAZIERS' AND SHEATHING COPPER, ROLLED, SHEET & PLATERS' BRASS

GERMAN OR NICKEL SILVER Copper Wire for Electrical and other purpose Brass and German Silver Wire.

Copper Bivets and Burs, COPPER BOTTOMS FOR TEA KETTLES AND BOILERS. Cor. Larned & Fourth Sts., Detroit, Mich.

ROME IRON WORKS,

Manufacturers of

Brass, Gilding Metal, Copper and German Silver (In Sheets, Rods, Tubing or Wire),

COPPER & BRASS RIVET AND BURS.

Rome, New York.

BROWN & BROTHERS.

81 Chambers St., N. Y. Waterbury, Conn. MANUFACTURERS OF

BRASS, COPPER AND **GERMAN SILVER**

In Sheets, Rolls, Rods, Wire, Tubing,

Rivets, and Burs, Etc.

ALSO.

Seamless Brass & Copper Tubing.

PATENTED SEAMLESS BRASS AND COPPER HOUSE BOILERS, warranted to stand 200 lbs pressure and guaranteed against vacuum,

PATENTED SPRING TEMPERED SHANK SILVER-PLATED, FLAT TABLE WARE, in rich

A. C. NORTHROP. Waterbury, Conn.,

NOVELTIES IN BRASS AND OTHER METAL GOODS

FOR HARDWARE TRADE.

Wrought Iron and Brass Machine Screws; Turned, Hexagon, Round and Square Head Cap and Bet Screws; Brass and Iron Safety and Jack Chain; Gilt, Nickel Plated and Bronse Trimmings of all kinds, from Sheet Iron, Steel for Brass.

Estimates on patented articles, or any description of Sheet Metal work, respectfully solicited and promptly given.

BRODERICK & BASCOM ROPE CO.. MANUFACTURERS OF

WIRE ROPE BRODERICK& BASCOM ROPE Co.

IRON WIRE ROPE. STEEL WIRE ROPE. 728 N. Main St., St. Louis, Mo.

CO., WORCESTER WIRE

IRON AND STEEL





The Plume & Atwood Mfg. Company.

SHEET and ROLL BRASS and WIRE. German Silver and Gilding Metal, Copper Rivets and Burs,

Copper Electrical Wire, Pins, Brass Butt Hinges, Jack Chain,

Kerosene Burners, Lamp Trimmings, &c. 18 Murray Street, New York. 13 Federal Street, Boston. 109 Lake Street, Chicago. Rolling Mill, Factories, THOMASTON, Ct. WATERBURY, Ct.

Bridgeport Brass Co.,

Sheet and Roll Brass, Brass & Copper Wire & Tubing, Seamless and Brazed Tubing, Copper and Iron Rivets.

OILERS and CUSPADORES, | LAMPS and TRIMMINGS, LANTERNS and TRIMMINGS, KEROSENE BURNERS, Clocks & Fly Fan Movements, PLUMBERS' MATERIALS. Particular attention paid to cutting out Blanks and manufacturing Metal Goods.

MARUFACTORY, WARRHOUSE,
Bridgeport, Conn. 19 Murray St., N. Y. MARUPACTORY, WARRHOUSE

HARRISON WIRE CO..

ST. LOUIS, MO.,

MANUFACEURERS OF ALL KINDS OF

STEEL AND IRON

ROPE

Holmes, Booth & Haydens, WATERBURY, CONN.

NEW YORK.

18 Federal St

Brass, Copper & German Silver, ROLLED AND IN SHEETS.

BRASS & COPPER WIRE, Tubing, Copper Rivets & Burs.

BRASS & IRON JACK CHAIN, DOOR RAIL. German Silver Spoons,

SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c. JOHN DAVOL & SONS,

Brooklyn Brass & Copper Co., Ingot Copper, Spelter, Lead, Tin,

Antimony, Solder & Old Metals.

PASSAIC ZINC CO Manufacturers of

Pure Spelter

Cartridge Brass, Gas Fixtures, Bronzes AND ALL PINE WORK. Also for

Galvanizers & Brass Founders. MANNING & SQUIER, Gen'l Agents, 113 Liberty Street, N. Y.

Geo. W. Prentiss & Co., HOLYOKE, MASS., MANUFACTURERS OF



Bright, Coppered, Annealed and Tim Plated. Also GUN SCREW WIRE



BROWNING, SISUM & CO., 85 Chambers St., BROWNING, SISUM & COL,

Baufacture

Belt Heeks, Cotters, Spring Reys. D Rings

Belt Heeks, Cotters, Spring Reys. D Rings

Staples, and everything pertaining to wire bending

Staples, and everything pertaining to wire bending

Factory DROOKLYN,

Factory DROOKLYN,

WASHBURN & MOEN MANUFACTURING CO.



IRON and STEEL WIRE

Patent Steel Barb Fencing, Patent Steel Wire Bale Ties. WIRE HODS of all Grades; Round from Rivet quality, 3-16 in, to 4, in, cut to any length. Owners and to operators of the PATENT CONTINUOUS HOLLING MILL, producing Iron and Steel Wis of 100 pounds, without seam or well. Patent Galvanized Telegraph Wire, Market and Ston lessed Fence and Grape Wire in long lengths; Coppered Pail-Ball Wire; Rope, Bridge, Boit, Screw, Rivet, Chain Wire. Wire for the manufacture of Coard Clothing, Heddles, Reeds, &c. Plano-string Covering and Broom Wire and Tinned-plated Wire for a specialty is made of Clock, Machinery, Gun Scrab Spring Wire, and Refined Wire to Fattern for particular purposes, from selected stamps of Norway a trade of Wire furnished. Annealed Bright. Polished. Concered, Galvanized or Tip Plated. Wire for to transned, Anaesied Bright, Folimhed, Coppers fut to any length. Steel Crineline Wire, Pater te for Springs, Needles and Drills. Market Steel WAREHOUSES: New York, 16 Cliff, and 241 Pearl Sts. Chicago, 107 and 199 Lake St.

"NATIONAL WIRE AND LANTERN WORKS."

HOWARD & MORSE.

THE "BOSS" TUBULAR LANTERNS.





Warehouse, 45 Fulton Street, New

ABRAM S. HEWITT, President. WM. HEWITT, Vice President.

THE

JAMES HALL, Treasurer. E. HANSON, Secretary.

RENTON IRON COMPANY,

TRENTON, N. J., Manufacturers of

BRIGHT, ANNEALED, COPPERED, TINNED AND GALVANIZED Iron and Steel Wire Rods:

EXTRA QUALITIES OF BAR IRON AND RODS. Best Qualities of Gun-Screw and Charcoal Iron Wire; Crucible, Siemens-Martin and Bessemer Steel Wire.

> Wire Straightened and Cut to Lengths. New York Office, COOPER, HEWITT & CO., 17 Burling Slip. Philadelphia Office, JOHN HEWITT, Agent, 21 North Fourth St.

For Hoisting, Running & Standing Ropes, Ferries, &c. CONSTANTLY KEPT ON HAND.

Address: HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.



This advertisement changed weekly. **IOWA BARB WIRE CO.**

87 Liberty St., New York.

IOWA IRON POSTS.

These are formed of a solid piece of wrought iron, are 6½ feet long, 30 inches of which are set in the ground, and are punched for our lines of wire 12 inches apart. The Barb Wire can be fastened on, either by short pieces of wire passed around and through the holes and twisted or tied in a knot, or by common staples olinched on the opposite side. These posts can be set without digging holes, although in extremely hard ground it is advisable to drive down a crowbar or piece of iron before putting down the post. They weigh about 10 pounds. List Prices, for regular size as above (extra when different length or number of holes): when different length or number of holes):

IRON POSTS, Painted, 45 Cents. Galvanized, 60 Cents.

A. LESCHEN & SON,

Rope.

OF EVERY DESCRIPTION.

Correspondence invited

GLA Catalogu

WHITAL NEW YOR

CH

BERG

Superior :

BER

TH

E. A. FIS

Wago

Send for C

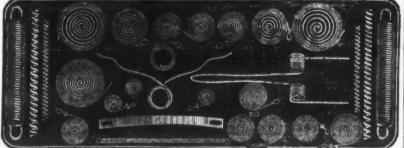


O. LINDEMANN & CO. Manufacturers of all kinds of

Japanned, Brass & Tin Plated BIRD

CAGES

CARY & MOEN, STEEL WIRE for all purposes, and STEEL SPRINGS of every description.



Market Steel Wire, Crinoline Wire, tempered and covered Patent Tempered Steel Furniture Springs, constantly on hand

Studs, Pins, Screws, &c.,

POPE, COLE & Co. BALTIMORE COPPER WORKS

No. 57 South Gay St., BALTIMORE, MD.,

INGOT COPPER.



BIRD CAGES

46 Park Place, NEW YORK.

patterns and unsurpassed in trated Catalogues and Price

W. S. TYLER, MANUFACTURER OF STEEL WIRE CLOTH

Of Every Description,

for mining purposes. All meshes from 2 to the inch up to 100-mesh made and carried in steel

CLEVELAND WIRE WORKS, Cleveland, Ohio.

Bergen Port Spelter.

PURE

LEHICH SPELTER

From Lehigh Ore. Cartridge Metal and German Silver.

BERGEN PORT OXIDE ZINC. Superior for Liquid Paint on account of its body and wearing properties.

BERGEN PORT ZINC CO. E. A. FISHER, Agent, 13 Burling Slip, N. Y.



Wagon Tire Upsetter. The Cheapest and Best.

LITTLE CLANT MFC. CO.
Send for Circular.

Millport, N. Y.

EMPIRE NUT CO. PITTSBURGE, PA. Hot Pressed NUTS.

Small Sizes a Specialty TATUM & CO., WHITALL, PHILADELPHIA, NEW YORK, MANUFACTURERS OF

CHEMICAL AND OTHER

GLASSWARE. Catalogues sent upon application,

For Manufacturers of Light Hardware.

HOE STEEL, of special make. so tough that it will not crack at the edge when being plated or drawn out thin; so soft it will allow the eve to be drawn easily, and yet so high in temper that it will harden and be stiff. For sample and price, address GAUTIER STEEL DE-PARTMENT of Cambria Iron Co., Johnstown, Pa.

[No. 32.]

THE AMERICAN WIRE COMPANY,



MARQUETTE STREET WORKS.

Every Descript on. ALVANIZED. TINNED and COPPERED

> High Grade and Fine Qual CLEVELAND, OHIO.

J. A. EMERICK. HOWARD EVANS MANUFACTURERS MOLDERS' TOOLS FOUNDRY FACING, MOLDING SAND, FOUNDRY SUPPLIES. J. A. EMERICK & CO., 1056 to 1076 Beach St., PHILADELPHIA.

ESTABLISHED 1837. H. S. CHASE, Sec'y.

INCORPORATED 1876. C. F. POPE, Treas.

Waterbury WATERBURY, CONN.

Brass Goods.

RIVERSIDE FOUNDRY WORKS.

ROLLING MILL AND MACHINERY CASTINGS, ROLLS. CLEVELAND, OHIO.

INGOT MOLDS, ANNEALING POTS, HOT BLAST PIPE, &c.

FOR STEEL REFINERS. WE OFFER AUSTRIAN CHARCOAL HAMMER STEEL.

In Plat Bars, deliverable in quantities to suit; in bond or duty paid. Correspondence solicited. Sample Bars on hand.

Correspondence solicited. Sample Bars on hand.

WOLTMAN & MICKERTS, No. 5 N. Second St., St. Louis, Mo. W. F. Smith have now become much and in practice each man so engaged can used, and as a large amount of their work keep a works employing 150 men (exclusive).

Modern Methods of Cutting Metals.

In an interesting paper bearing the above title, and recently read before the British Institution of Mechanical Engineers, Mr. W. Ford Smith stated that right and left hand round tool-holders are used in different machine tools, principally for roughing out—or, in other words for rapidly reducing costin other words, for rapidly reducing cast-ings, forgings, &c., from their rough state nearly to their finished forms and dimensions. The tool-holders are so called from their cutters being made of round steel cut from the bar. Notwithstanding that they are very widely applicable, take heavy cuts, and do the bulk of all machine-working lathes, and in planing, sharpening and slotting machines, it was soon found that they could not compass the whole of the work required in the shops, and it was therefore necessary still to allow the use of some of the common forged tools in conjunction with the round tool-holders. This, howver, was objectionable, as no positive rule could then be laid down to define what number of forged tools should be allowed to each workman, and it became apparent that the tool-holder system, in order to reach the highest degree of efficiency, must be made complete and independent in itself. This led to the designing of another tool-holder of the most general kind the writer could pos-BLAKE & JOHNSON, Waterbury, Conn.

the most general kind the writer could possibly devise, in the hope thereby to complete the system. With this object in view, all the remaining forged tools then in use were collected together and a swivel toolholder was schemed, with cutters so adjustable that they could not only be swiveled round and then fixed to any desired angle, but could be made to project at pleasure to any required distance in order to reach and cut into all sorts of difficult and awkward corners; in fact, to machine any work which corners; in fact, to machine any work which the round tool-holder could not finish. Two of the principal objects simed at were to devise a system of cutters which should not require any forging or smithing, and yet should be capable of being adapted by the simplest possible means and by grinding the ends only to all forms which the round cutters would not admit. The special section of steel decided upon was a sort of deep V-section, the lower part of which is slightly rounded. The angles of the sides give the same amount of clearance (1 in 8) as that given in the round tool-holders, and this same angle of clearance is given to the ground parts. The section of the swivel-cutter is made very deep in order to obtain ample strength in the direction of the pressure it has to support when cutting. The angle is that common to every swivel toolholder. In the cutter for the round tool-holder two angles had been fixed upon as standards, one to cut all kinds of wrought metals, the other all cast metals. To avoid complication, however, in the swivel toolholders, one cutting angle was fixed upon for all metals and applied to all cutters. The angle selected is one slightly differing The angle selected is one slightly differing from that of the round cutters, but is that which worked the best in practice. The cutters of the round tool-holder system are found most advantageous in producing and finishing standard size round corners in journals of shafts, &c., and in other cases where the engineer of the present day is anxious to preserve all the strength he can in the parts he is constructing; but there are still cases where square, angular or are still cases where square, angular or undercut surfaces must be produced.

The cutter for planing the under horizontal surface of a lathe-bed is ground to an angle of 86°, and thus has a clearance of 2° at each side when cutting either horizontally or vertically. This cutter is very general in its applicability, and is devised so as to finish with one setting both the vertical surface and the horizontal surface, without the necessity of disturbing the cutter in any way. The ordinary system is to use at least two tools for roughing out and two for finishing on two surfaces at right angles with each other

Another form is a swivel tool-holder with a round shank, such as is used on the slide-rest of a screw-cutting lathe for cutting quare threads. It is carried on a wrought ron or steel block, provided with a groove semicircular in section, in which the round shank of the tool-holder lies, and is clamped down in the usual way. The cutters for cutting out the spaces between the square threads are of very simple form, and by aid of this tool-holder any tool of the correct width of the space will cut either right-hand or left-hand screws, no matter whether they To cover the same ground with forged tools no less than six expensive cutters would be required, each one forged from square steel and carefully filed up and hardened. With the tool-holder only one cutter is required, and it costs probably not more than 10 per cent. of one of the six forged tools, while it maintains its size much better, and consequently lasts much longer.
It also takes about twice the weight of cuttings per hour, as compared with an ordinary forged tool. This system is useful where many screws of odd forms and pitches are required; but where there are sufficient numbers to be cut, special chasing lathes are for regrinding milling-cutters. In this case gristone does not answer, and the grinding wheels are obliged to be of emery or coruntum. They are very small in diameter, and many of them are exceedingly thin, and so delicate in form that if made of gristone they would rapidly lose their shapes. They are numbers to be cut, special chasing lathes are far preferable to ordinary screw-cutting lathes, as they will do about six times as much chasing of V-threads or cutting of while revelving, by means of a diamord, while revelving, by means of a diamord, and the control of the con square threads as can be accomplished in the ordinary lathe in the same time. Instead of carrying one chaser, the chasing lathes carry, in a chasing apparatus, three or four chasers, and these have their threads, four chasers, and these have their threads, whether square, V, rounded or any other form, cut in their places by aid of a master-tap. They are then tapered at the mouths, backed off and hardened ready for work. from a screw by this process varies from 12 to 24, according to the size, strength and pitch of the thread. Screws up to 6 inches diameter can be very readily cut by this system. When the two systems—the round and the swivel tool-holder—are worked in conjunction with each other, their universal. conjunction with each other, their universality of application is so thorough that almost every difficulty is met, and it was only in the content of the con ity of application is so thorough that almost every difficulty is met, and it was only in the case of paring and shaping articles in the slotting machine that two modifications the process of grinding is thus reduced to a

is done upon black bars of iron, steel or other metals, each of which has to be finished at its extremities and cut or parted off, it was found advisable to make one special it was found advisable to make one special tool-holder to carry tools of the correct sections to produce the desired shapes for the ends; the tedious and unreliable process of turning the ends with hand turning tools is thus avoided. Each cutter is of absolutely thus avoided. Each cutter is of absolutely the same section throughout its entire length, and the resharpening is done by grinding the end of the cutter only so that it can but produce the same standard form as long as it lasts—that is to say, till it is ground to short to be used any longer. The parting off might have been accomplished by the swivel tool-holder, but a special form is found to be more convenient in parting off close up to the chuck or lathe spindle.

To produce a maximum amount of cutting

in a minimum space of time there are two main points that must be carefully attended to. These seem to be applicable to all cutters for cutting metals, whether they happen to be those fixed rigidly in tool boxes, as in turning lathes, planers, shapers, slotters, &c., or those that cut while they revolve, as milling cutters, twist drills, boring bits, &c.

These two important points are: First, the angle of the cutting surface (or cutting edge,
—i.e., that surface which removes the shavings of metal and upon which the pressure
of the cut comes. Secondly, the angle of
the clearance surface (or clearance angle). To produce the best results and to insure the utmost simplicity it is important that these two angles be correctly constructed in the first instance. The best measure for both angles has been arrived at from actual prac-tice and a series of experiments. When once obtained and started with, they would not alter by use, but always remain constant, if the greatest amount of cutting efficiency is to be achieved. When aided by a me-chanical system of regrinding and the use of chanical system or regrinding and the use of standard angle gauges, there is no difficulty in maintaining the exact angles. The only changes which take place are that the cut-ters in tool-holders become gradually shorter by grinding, and that milling cutters during a long period of time become very gradually smaller in diameter, by the process of re-sharmening them on a fine emergency wheel. In sharpening them on a fine emery-wheel. In the case of the tool holders, as already explained, the cutting angle is maintained by the system of regrinding, and the teol-holder itself always maintains the clearance angle. The system is thus simplified, as will be clearly understood when it is remembered that each one of the tool-holder cutters (no matter of what description) is ground on its end only. The section is thus never altered. and only. The section is thus never altered, no smithing or alteration in form is necessitated, and consequently no repairing has to be done in the smith's shop. The objects aimed at have been: I. To produce the highest class of workmanship by providing the best-known form of cutters, carefully made, and capable of having the cutting edges accurately reground, so that the surfaces of the machined work may be produced direct from the cutters so highly works and that we handwork could possibly duced direct from the cutters so highly finished that no handwork could possibly improve them. All the turning of wrought iron, for instance, is so perfectly finished that there is no necessity to polish it by means of emery or emery cloth. 2. To make all the cutters so free from complication, and simple to keep in order, that ne diffi-culty or error may take place in regrinding them. 3. Since finely-polished surfaces can-not be obtained without the most perfect cutting edges, to make all cutters not only of the best steel, but with their cutting edges most accurately and carefully ground up in almost all cases by mechanical means. up, in almost all cases by mechanical means. The durability of the cutters, from their construction and high class of material, i. very great, and they are thus capable of re-moving a great weight of metal in a give.

The grinding or resharpening of all cut-ting edges is reduced to the greatest simplic-ity, and only three descriptions of machines are requisite for this purpose. They are all arranged to grind mechanically—that is to say, the cutters, while being ground, are car-ried and pressed on the grindstone or emery-wheel by mechanism. The requisite forms and angles are also obtained by mechanism, it being found in practice that sufficient acit being found in practice that sufficient accuracy cannot be secured by hand-grinding.

The machines are as follows: I. A grindstone with slide-rest, for grinding all the cutters used in tool-holders. 2. A twistdrill grinder; this also is by preference a grindstone, with mechanism for holding and guiding the twist drills. A machine with an emery-wheel in place of the stone is also used for the grinding of twist drills, with and with less risk of drawing the temper. Both stone and emery-wheel are run at a high speed and used with water. 3. A small but very complete machine, as used ished, the cutter should be put into this machine, and the probability is that not more than 1-1000th inch need be ground off each tooth before it is restored again to a cutting edge almost as fine as that of a wood chisel.

had to be made in the holders, the same cut-ters being still applicable. complete and exceedingly simple system. In well-regulated shops a young man is selected

OGDEN & WALLACE, Marshall Lefferts & Co.,

Iron and Steel Of every descripton kept in stock,

Agents for Park Brother & Co.'s BLACK DIAMOND STEEL All sizes of Cast and Machinery Steel constantly on hand.

PIERSON

24 Broadway, New York City.

COMMON & REFINED IRON, Hoops, Rods, Scrolls, Bands, Ovals, Horse Shoe, Nail Rods, Steel, &c.

Orders promptly filled from stock.

ABEEL BROS.,

190 SOUTH ST., NEW YORK. "ULSTER" IRON,

"CATASAUQUA" IRON, ALLENTOWN SHAFTING, COMMON IRON,

And full assortment of sizes of the best brands of REFINED IRON.

Band, Hoop, Scroll and Angle Iron. Cast, Spring, Toe-Calk and S. S. Steel.

TELEPHONE CALL, " NASSAU, 379"

A. R. WHITNEY & CO., Manufacturers of and Dealers in RON

AGENCIES:

PORTAGE IRON CO., Limited, Merchant Iron. SAMSONDALE IRON WORKS, Merchant Iron. NORWAY IRON AND STEEL WORKS, Hon. BAY STATE IRON CO., Tank, Boiler and Girder

BAV STATE IRON CO., Tana, Bossel.

Plates.

H. P. NAILS CO., Wire Nails.
BRANDYWINE ROLLING MILL, Boiler Plates.
GLASGOW TUBE WORKS, Boiler Flues.

A. M. BYERS & CO., Wrought Iron Pipe.
CARNAGIE BROS. & CO., Limited, Wrought
Iron Beams, Channels and Shapes.
P'ams and estimates furnished, and contracts
male for erecting Iron Structures of every description.
Books containing cuts of all Iron made sent
on application by mail.
Bample pieces at office. Please address

ES Hudson Street, New York.

BORDEN & LOVELL, **Commission Merchants**

70 & 71 West St., L. S. LOVELL. C. A. GREENE, H. L. PREKLAND, Agents for the sale of

Fall River Iron Co.'s Nails, Bands, Hoops & Rods,

Borden Mining Company's Cumberland Coals.

WILLIAM H. WALLACE & CO., IRON MERCHANTS

Cor. Albany & Washington Sts. NEW YORK CITY.

WR. H. WALLACE.

MANUFACTURERS OF

Galvanized Sheet Iron,

Best Bloom, Best Refined and Common Galvanised Wire, elegraph and Fence; Galvanise Hoop and Band is m, Galvanised Rod and Bar Iron Galvanised Nails, Galvanised Chain, Galvanised Iron Pipe.

CORRUGATED SHEET IRON

For Roofing, &c., Galvanized, Plain or Painted Best Charcoal, Best Refined and Come SHEET IRON.

Plate and Tank Iron, C No. 1, C H No. 1, C H No. 1 Flange, Best Flange lest Flange Fire Sex, Circles.

ALL DESCRIPTIONS OF Iron Work Galvanized or Tinned to Order. Price list and quotations sent upon application

ROME MERCHANT IRON MILLS ROME, N. Y., Manufacturers of the best grade of

Bar Iron, Bands and Fine Hoops Scrolls, Ovals, Half Ovals, Half Rounds, Hexagon and Herse Shoe Iron. Also from Charcoal Pig a superior quality of Iron branded J. G. All puddled balls reduced by hammer. Orders may be sent to the Mill or to J. O. CARPENTER, our Agent, at 59 John Street, New York.

DRUMMOND FOX & RAILWAY

ROLLING MILL MATERIAL.

WALL STREET,

NEW YORK.

JAMES WILLIAMSON & CO., SCOTCH AND AMERICAN

PIG IRON,

No. 63 Wall St., New York.

ULSTER IRON WORKS

90 Broadway, New York.

Tuckerman, Mulligan & Co

CARMICHAEL & EMMENS 130, 132 & 134 Cedar St., New York, and Nos. 21, 23, 25 & 7 West Lake St., Chicago, Ilt.

IRON AND STEEL BOILER PLATE. Lap-Welded Boiler Tubes, &c. &c. Agent for Otia celebrated Cast Steel Boiler Plates. The Costeeville Iron to. The Laurel Rolling Mills, and Union Tube Works; Wrought Iron Beams, Angles. Tees, Rivets, &c.

ENTERPRISE MANUFACTURING CO. ALKER & CROMLISH, Iron and Steel Forgings.

Light Machinery Forgings a Specialty. Estimates furnished, and all work executed promptly at the most reasonable rates. Nos. 215 & 217 Main Street,

ALLEGHENY, PA. GRAY IRON CASTINGS. JOHN KEPPELMAN, Reading, Pa.,

Herewith gives notice that he has opened a Job bing Foundry, and is ready to receive orders for all kinds of Light Gray Iron Castings; also, for every description of Machinery. Orders premptly every description of small filled. Please address
JOHN KEPPELMAN, Cor. sd and Court Sts.,
Reading, Pa.

ORFORD NICKEL AND COPPER COMPANY, SMELTERS AND REFINERS OF

THOS. J. POPE & BRO., Agents, 292 Pearl St., New York.

Copper Ore, Mattes or Bullion purchased. Advances made on consignments for refining and sale citing and Refining Works at Bergen Point, near New York. Offices, 293 Pourt St., New York.

PASSAIC ROLLING MILL CO., LED IRON BEAMS,

Channels, Angles, Tees, Merchant Bars, Riveted Work, Forgings, Eye Bars, &c.

PATERSON, N. J. Room 45, Astor House, New York.

CUT NAILS,

Hot Pressed Nuts, Bolts, Washers, &c.

DOVER IRON CO.'S

BOILER RIVETS

Butter Brace Jaws, Socket Bolts, &c.

FULLER BROTHERS & CO

139 Greenwich Street, New York.

OXFORD W. D. WOOD & CO.'S

IRON AND NAIL CO., Nails Cut

SPIKES.

J. S. SCRANTON, Sales Agent, 81, 83 and 85 Washington Street, NEW YORK,

JOHN W. QUINCY & CO.,

98 William Street, New York. Anthracite & Charcoal Pig Irons, Wrong & Scrap, Cut Nails, Copper,

BLOCK TIN, LEAD, SPELTER, ANTIMONY, NICKEL, &c.

${f HARRISON\&GILLOON}$ IRON AND METAL DEALERS, 450, 562 WATER ST., & 31.2, 314, 306 CHERRY ST. NEW YORK,

nave on hand, and offer for saie, the following: Scotch and American Fig Iron, Wrought, Cast and Machimery Scrap Iron, Car Wheela, Agics and Heavy Wrought Iron: also old Copper, Composition, Brass, Lead, Pawter, Zinc, &c.

BURDEN'S HORSE SHOES

"Burden Best" Iron

Boiler Rivets.

Troy, N. Y.

ULSTER

BURDEN'S

& S. Bar Iron

American & English Refined Iron

EGLESTON BROS, & CO. 166 South St., NEW YORK CITY.

FRANK L. FROMENT.

IRON AND STEEL. Pencoyd Iron Works,
Maidencrock Iron Co.,
Marshall Iron Co.,
Still Water Co., Iron Beams, Heep & Band Iron.

W. S. MIDDLETON, **Broker in Machinery & Iron**

FORSTER'S CRUSHER & PULVERIZER, W. S. MIDDLETON, 54 John St., N. Y.

B. F. JUDSON. Importer of and Dealer in SCOTCH AND AMERICAN

Pig Iron, Wrought & Cast Scrap Iron,

OLD METALS.

457 & 459 Water St.; } NEW YORK.

Manhattan Rolling Mill. J. LEONARD.

445 to 451 West St., 177 & 179 Bank St., NEW YORK, Manufacturer of

HORSE SHOE IRON, Toe Calk Steel, Rods, Ovals, Half Ovals and Flats.

DANIEL F. COONEY,



PATENT

Planished Sheet Iron

Patented March 14th, 1865; April 8th, 1873; Sept. 9th, 1873; Oct. 6th, 1874; Jan. 11, 1876. Guarantoed fully equal in all respects to the

IMPORTED RUSSIA IRON, and at a much less price.

FOR SALE by all the principal

METAL DEALERS In the Large Cities throughout

THE UNITED STATES. And at their Office.

111 Water Street, PITTSBURGH, PA. SYRACUSE MALLEABLE

IRON WORKS.

SYRACUSE, N. Y.

Mower and Reaper Castings and Carriage Irons a Specialty.

W. B. BURNS, Proprietor.

C. W. LEAVITT, 161 Broadway, NEW YORK. **REW AND SECOND-HAND**

Rails and Railway Equipment PIG and BAR IRON, OLD RAILS and SCRAP. General Agent ALLENTOWN ROLLING MILLS. Agent for PARDEE CAR & MACH, WORKS.

KINNEIL The Burden Iron Company SCOTCH PIG IRON

FOR SALE IN LOTS TO SUIT, **EDWARD J. WESSELS** SOLE AGENT FOR THE

UNITED STATES, 17 Cedar St., - - NEW YORK. F. W. JESUP & CO.,

Railway Supplies and Equipment. No. 67 Liberty St., NEW YORK.
Agents NASHUA IRON AND STEEL CO., Manufacturers of
STEEL LOCOMOTIVE TYRES, HOMOGENEOUS
STEEL BOILER PLATES, IRON AND STEEL AXLES,
CRANK PINS, PISTON RODS, SLIDES, &c. IRON AND STEEL LOCOMOTIVE FORGINGS.



STEEL TOE CALKS.

Extra Quality Homogeneous Steel

STEEL PLATES, all descriptions. Cut Nails and Spikes, Plate and Sheet

Iron, all descriptions. SHOENBERGER & CO., Picceburgh,

WHEELING

Laughlin Nail Co., JUNCTION IRON CO., Joint Yearly Capacity Over

600,000 KEGS. Manager Sales Dep't,

97 Chambers Street. New York. KEYSTONE ROLLING MILL, Limited.

IRON Pittsburgh, . . . Pa.

Bonnell, Botsford & Co., Iron, Nails & Spikes.

YOUNGSTOWN, OHIO. CORRUGATED AND CRIMPED IRON ROOFING & SIDING,

Iron Buildings, Boofs, Shutters, Doors, Cornices, Skylights, Bridges, &c. MOSELEY IRON BRIDGE AND ROOF CO., 5 Dey Street, New York.

GLENGARNOCK AND CARNBROE SCOTCH PIG IRON.

For spot delivery and for prompt or forward shipments to New York, Boston, Philadelphia, Baltimore or New Orleans. For sale in lots to suit by

JAMES LEE & CO., Sole Agents for the United States. 101 Milk Street, BOSTON. MASS. 72 Pine Street, NEW YORK.

LEECHBURG IRON WORKS KIRKPATRICK & CO., FINE SHEET IRONS,

Show Card, Stainping, Tea Tray, Polished, Sh. NATURAL GAS USED AS FUEL. WORKS, Larenber CHARLES HUBBARD,

"MT. LAUREL" & "TEMPLE" BRANDS PIG IRON. "CHARCOAL" PIG IRON, "MAIDEN CREEK" and "NEW RIVER MINERAL" BRANDS FAVORITE BRANDS OF SCOTCH PIG IN STOCK AND TO ARRIVE.

46 Cliff Street, Now York City. Old Car Wheels, Best Brands. JAMES W. ROSS,
IMPORTER OF AND FURNACE AGENT FOR SCOTCH AND AMERICAN PIG

MANUFACTURERS' AGENT OF

Bar Iron, Car Wheels, Axles, Rails and Railroad Supplies. WHITAKER IRON

COMPANY, OF WHEELING, W. VA., MANUFACTURERS OF SHEET IRON, TANK AND FIRE BED, 36 DEARBORN STREET CHICAGO.

THE JERSEY CITY GALVANIZING CO., CALVANIZED MATERIAL OF EVERY DESCRIPTION.

GALVANIZING IN ALL ITS BRANCHES.

Galvanized Sheet Iron—Best Bloom, Best Redned, Common. Galvanized Round, Square Band and Hoop Iron, &c., &c. of Corrugation

All Gauges and Blues

Ra

SHE

SU

CH

Works 108

BOILER PLATES AND SHEET IRON,
LAP-WELDED MOTION FLUES,

**Enfor Rivets, Angle & T Iron, Cut Nails & Spikes.

Agency for Glasgow Iron Co., Jos. L. Balley & Co.,
Pine Ison Works, Lebanon Rolling Mills, Chester
Pine and Tube Co., Albany & Reps. Iron & Ricel Coins
celebrated Doller Rivets: Homogeneous Ricel, Bellyr

MORKS, GREEN AND BAY STREETS, EASEY CITY, B. I., OFFICE AND WAREHOUSE, 28 JOHN STREET, NEW YORK,
and Fur Reps Plates.

Siemens' Regenerative

RICHMOND & POTTS, 119 S. Fourth St., PHILADELPHIA, PA.

HENRY LEVIS & CO., Manufacturers' Agents

For Iron and Steel Rails, Car Wheels, Boiler and Sheet Iron and General Railway Equipments.

Old Rails, Axles, and Wheels bought and sold. 234 S. 4th St., Philadelphia.

Steel Works. Cambria Iron and

The Cambria Iron Co.,

having enjoyed a reputation for more than a quarter of a century for fair dealing and excel-lence of its manufactures, has now a capacity of 150,000 Tons of Iron & Steel Rails

And most approved patented Railway Fastenings.

CAMBRIA IRON COMPANY, or at Works, Johnstown, Pa., or Lenax Smith, Selling Age t, 46 Pine St., New York. The Cambria Iron Co.,

having acquired the entire ownership of the WIRE AND STEEL MILLS Of the GAUTIER STEEL CO., Limited, will continue to produce all their specialties, such as Merchant Steel, Piow Steel, Wagon and Carriage Springs, Rake Teeth and Harrow Teeth, Agricultural Implement Steel and

ALL KINDS OF WIRE,

Well-known for superior quality of material and excellence of workmanship. Address
GAUTIER STEEL DEPARTMENT,
PHEIP E. CHAPIR, Gen'l Sup't, Johnstown.
New York Warehouse, St John St.
Philadelphia Warehouse, 523 Arch St.

IRON PHŒNIX

410 Wainut Street, PHILADELPHIA.

Beams, Deck Beams, Channels, Angle & Tee Bars, ETRAIGHT AND CURVED TO TEMPLATE.

Largely used in the construction of Iron Vessels, Buildings and I

WROUGHT IRON ROOF TRUSSES, GIRDERS & JOISTS, PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,

PATENT WROUGHT IRON COLLEGE, and built up shapes for Iron Bridges.

**BEFINED BAR, SHAFTING, and every variety of SHAPE IRON made to order.

DAVID REEVES, President.

DAVID REEVES, President.** Plans and Specifications furnished. Address
NEW YORK AGENTS, MILLIKEN & SMITH, 95 Liberty Street.
BOSTON AGENTS, FRED. A. HOUDLETTE & CO., 19 Batterymarch St.

ALAN WOOD & CO.,

MANUFACTURERS OF

Patent Planished, Gaivanized, Common, Best Refined, Cleaned and Charconi Bloom

PLATE & SHEET IRON. No. 519 Arch St., Philadelphia, Pa.

Orders solicited especially for Corrugated, Gasholder, Pan and Elbow, Water Pipe, Smoke Stack, Tank and Boat Iron; Last, Stamping, Ferruie, Locomotive Headlight and Jacket Iron.



JAS. ROWLAND

Kensington Iron, Steel & Nail Works,

920 North Delaware Acc., - PHILADELPHIA,

ANVIL BRAND REFINED MERCHANT BAR IRON.

Also, the James Rowland & Co. Kensengton Naits, cut from their Refined Anvil stock. Also, Plow and Cultivator Steel; Skelp Iron a specialty; also Rounds, Squares, Flats, Bands and Hoop

PENCOYD IRON WORKS. A. & P. ROBERTS & CO.,

MANUFACTURERS OF BEAMS, CHANNELS, DECK BEAMS,

ANGLES, TEES, PLATES, MERCHANT BAR. GANION IN

SHAFTING AND ROLLED OR HAMMERED AXLES OF IRON OR STEEL. Office, No. 26 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron. J. W. PAXSON & CO.,

DEALERS IN SAND. MOULDING



E DESNEERAL XX MINERAL, IXL FACING.

MANUFACTUREBS CHARCOAL FACING. ANTHRACITE FACING,

LEAD FACING. STEEL BRUSHES.

ALLENTOWN ROLLING MILL COMPANY,

Rails, Bars, Axles, Shafting, Fish Bars (Plain and Angle), Spikes, Rivets, Bolts and Nuts, &c. Bridges and Turn Tables. Works at Allentown, Pa General Office, 237 South Third St., Philadelphia.

JAMES C. BOOTEL

THOMAS H. GARRETT. ANDREW A. BLAIR

BOOTH, CARRETT & BLAIR, Analytical and Consulting Chemists,

919 and 921 Chant St. (10th St. above Chestnut St.), PHILADELPHIA PA. Established in 1836.

Analyses of Ores, Waters, Metals and Alloys of all kinds. A special department for the ANALYSIS OF IRON AND STEEL,

Sited with all the apparatus and appliances for the rapid and accurate analysis of Iron Steel, Iron Ores, Slags, Limestones, Coals, Clays, Fire Sands &c. Agents for sampling ores in New York and Raitivgore Price lists on application.

SHENANDOAH IRON, LUMBER, MINING & MFG. CO., MANUFACTURERS OF

SUPERIOR COKE PIG IRON FROM NEUTRAL HEMATITE ORES, Also

CHARCOAL PIG IRON AND BLOOMS FROM SAME ORES. Works at MILNES, PAGE CO., VA. Treasurer's Office, 130 WALNUT ST., PHILADELPHIA. JUSTICE COX, JH: & CO., Sales Agents; 294 South 4th St., Philadelphia,

Edward J. Etting,

IBON BROKER AND COMMISSION MERCHANT, 929 S. Third St., Philadelphia, Pa. Pig, Bar and Railroad Iron.

OLD RAILS, SURAP, &c.

Agent for the

MOUNT SAVAGE FIRE BRICK, The Allentown Iron Co. and the Greenwood Rolling Mill. STORAGE WHARF AND YARD
DELAWARE AVENUE ABOVE CALLOWHILL STREET,
ABBECTED by track with ralipoal.
Cash advances made on Iron.

Established 1837. A. PURVES & SON,

Scrap Iron, Metals and Machinery Cor. South and Penn Sts., Philadelphia, Offer for sale, in lots to suit, Red or Yellow Heavy Scrap Brass; lagot Brass, best qualities, Ingot Gur Metal made strictly from Old Cannon; S eam Funns Shafting Fulleys, &c. Machinery and Tools vari us descriptions. Cash paid for Scrap Iron and Metals

ISAAC V. LLOYD. LLOYD & LINDSAY,

No. 328 Walnut St., PHILADELPHIA Brokers and General Dealers in Iron and Steel, Hallway Equipments and Sapplies, Bar, Plate and Sheet Iron, Fig Iron, Rails and Fastenings, Muck Bars, Blooms, Boiler Tubes, Wrought Iron Pipe, &c. Old Rails and Scrap Iron. Florida Yellow Pine, carko lots.

J. O. RICHARDSON,

No. 232 Dock St., Philadelphia,

Pig Iron, Merchant Bar Iron and Iron Ores.

J. J. MOHR.

Sole Agent for

Sheridan, Leesport, Temple, Millcreek and Mt. Laurel BESSEMER, FOUNDRY AND FORGE PIG IRON,

CHARCOAL PIG IRON.

430 Walnut St., PHILADELPHIA, PA. G. A. HERERTON.

S. PRANE SHARPLESS. HEBERTON & CO.,

Selling Agents and Commission Merchants For the sale of Pig. Bloom. Plate, Bar, Scrap, Galvanicet, Black, Sheet, Pipe and Railroad IRON.

No. 220 So. 3d St., Phila. Charcoal Bloom and Pig a specialty.

JOSEPH P. REED & CO., Brokers and Commission Merchants, 361 S. Fourth St., Philadelphia. Sole Agents for

COOPER IRON MINING CO., Chester, N. J.
RIDGEVIEW COAL AND COKE CO. Lairobe.
J. D. BOYLE'S CONNELLSVILLE COKE.
HARBISON & WALKER'S FIRE BRICKS,
MAGNETIC and HEMATITE IRON ORES a Specialty.

anghorne Wister. Rodman Wister. J. N. M. Shimer & Co. L. & R. WISTER & CO., IRON BROKERS.

Scrap Iron a Specialty. Agents for the Clearfield Fire Brick Co.'s No. 930 South 4th St., Philadelphia.

WM. McFARLAND Iron and Brass Founder. TRENTON, N. J.

Chilled Cast Wire Dies a Specialty Any size or style made at short notice.

MORRIS, WHEELER & CO., IRON, STEEL & NAILS.

WAREHOUSE and OFFICES, | SALES OFFICES, 16th & Market Sts., 400 Chestnut St., PHILA., Vow Vork Address, 14 CLIEB ST

CHARLES E. BARNS. of molders or boiler-makers) well supplied JUSTICE COX. Jr. JUSTICE COX, JR., & CO.,

CHECKIES, CONEWAGO, MONTGOMERY AND BHENANDOAH

Foundry & Forge Pig Iron. CARBON ROLLING MILL CO., Limited, Best Quality Muck Bar. CATASAUQUA MFG. CO.'S

Bar, Angle, Skelp and Sheet Iron. Shenandoah (Va.) Best Charcoal Blooms.
No. 394 So. Fourth St., PHILA DELPHIA.

BLAKEY & WALBAUM, 206 S. Fourth St., PHILADELPHIA,

55 & 57 Pine Street, New York GENERAL MERCHANDISE BROKERS

SPECIALTIES, NEW AND OLD RAILS, BLOOMS, BESSEMER PIG,

Spiegeleisen Iron Ores AND RAILROAD SUPPLIES GENERALLY. Sole Agents for the United States for The North Lousdale Iron and Steel Co., Limited.

b., Limited.
ssemer Pig Iron, brand "ULVERSTON."
Malleable Pig Iron, brand "U. H. M."
B. ALLEN & CO.'S DWAS FIRE BRICKS.

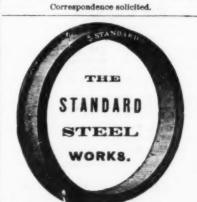
JEROME KEELEY & CO.,

906 Walnut Place, Philadelphia. SELLING AGENTS FOR CHABCOAL and ANTHRACITE BLOOMS, PIG IRON, BAE IRON, SHEET IRON, STEEL and IRON RAILS, IRON CLAD STEEL RAILS and BARS, MAGNETIC and HEMATITE IRON ORES FIRE BRICK, COAL and OKE. MUCK BARS, Handle Old Iron and Steel Rails, Ecrap Iron &c. Examine and negotiate sales of Iron and Coal properties.

E. H. Wilson. A. Kaiser. J. B. M. Hirons.

E. H. WILSON & CO., 230 South Third Street, Philadelphia.

BROKERS AND DEALERS IN IRON AND STEEL.



LOCOMOTIVE AND CAR WHEEL VIRES. BRAND

STANDARD. J uality and efficiency fully guaranteed. Prices as was any of the same quality. We manufacture leavy and light Possings, Driving and Car Axles, rank Pins, Piston ROM, &c.

Works at Lewistown, Pa. Office, 230 S. 4th St., Philadelphia, Pa.

J. W. HOFFMAN & CO., Iron Merchants & Railway Equipments.

308 South Fourth St., Philadelphia. Sole agents Glasgow Iron Co. and Pine Iron Works manufacturers of Muck Bar and all grades of Plate Iron. Celebrated "Glasgow" and "Pine" brands for fire boxes and difficult flanging. Pig and Bar Iron, Ralis and all shapes in Iron. Quotations given on Bridge and Building Specifications.

ETHELBERT WATTS, IRON BROKER AND COMMIS-SION MERCHANT,

No. 326 Walnut St., Philadelphia. Pig, Muck and Bar Iron, Scrap, Etc.

Also, COKE, IRON ORES, BIT. COAL. ANDOVER PIG IRON,

ndorer Chill Iron for Carwheels, &c. Each pig marked exact chill depth (14 inch to 14 inch). A. Whitney & Bon's standard test. J. WESLEY PULLMAN, Agent F. A. COMLT, Treas. 407 Walnut St., PHILADELPHIA.

"Cumberland" Nails and Wrought Iron Pipe, 43 North Water Street and 44 North Delaware Avenue, PHILADELPHIA.

J. TATNALL LEA & CO.,

Successors to CABEEN & CO.,

IRON COMMISSION MERCHANTS,

Buckessors to CABEEN & CO.,

IRON COMMISSION MERCHANTS,

There have oden special cases where it has been advantageous to take thin shavings 3 to 6 inches in width. The principal lumits to broad-cutting are as follows: 1. The power of grinding the cutting tool to a sufficiently No. 400 Chestnut Street, Philadelphia.

BESSEMER, MILL AND FOUNDRY PIG IRON, SKELP IRON, MUCK AND SCRAP BARS NATIVE AND FOREIGN ORES, A. A. HUTCHINSON & BRO,'S CONNELLSVILLE COKE.

GROOME, ROBERTS &

(FORMERLY OF J. P. BAILEY & CO.), IRON AND STEEL COMMISSION.

216 South Fourth Street, PHILADELPHIA.

Beams, Channels, Angles, Sheared and Universal Plates, Car Axles, &c. BRIDGE SPECIFICATIONS A SPECIALTY.

BRADLEE & CO., EMPIRE CHAIN WORKS, 816 Hichmond St., Philadelphia. Sproisi attention given to the Manufacture of Chains for of drilling and boring, and on the cuts crans; Mining and Dredging Chains; "D. S. G." special very much might be written if time of mitted. Many engineers have used to

with all the necessary cutting tools from to day. A very great saving is thus effected, as no machine need ever stand idle for went of cutters. Take, for instance, an engineering works employing 250 men. The requisite number of improved grinding machines, with special mechanical appliances, is as follows: Two patent grindstones for re-sharpening cutters mechanically; one patent twist-drill grinder for resharpening twist-drills mechanically; one improved cutter-grinder, with small emery-whoel, for the resharpening of cutters used in milling machines. To follow the system out satisfactorily, the man working the grindstone goes round to each machine every morning, collects together those cutters which have been blunted by use the previous day, carries them to his grindstone, resharpens them and distributes them out again to each ma-chine, which is thus kept well stocked with an ample number of cutters always ready for immediate use. The cutters for tool-holders do not require any repairing in the smithy; consequently that operation, which is costly in many ways, is avoided, and jobbing or the cutters a rule is made that when the grinder meets with cutters which are not as hard at their cutting points as they ought to be, he puts them on one side, and periodically —say, once each fortnight—he sends the lot into the smithy for the end of each to be re-tempered. This is a very inexpensive operation. They are placed in a small oven by dozens and very slowly heated to a dull red; the end of each cutter is then plunged into a perforated iron box, the bottom of which is covered with the required depth of water, to harden the cutter to the proper distance from its point. The cutters are left standing in a nearly vertical position in the box of water until they have gradually cooled down sufficiently to be removed. They are then sent to the grindstone, reground and given out with the other cutters, to be again used in the different machines. With steel of the highest quality for cutters it is most important to keep it out of the smith's fire entirely, if possible. That object is here attained, the cutters never going to the fire except for rehardening. During the life of a cutter it only sees the fire probably six

As the weight of each cutter is small, probably not more than from 1-15th to 1-20th that of a forged tool used for the same purpose, the outlay for best tool steel is not heavy, and the engineer is not tempted to purchase any but that of the highest quality. With such steel, especially when used in the best manner, each machine is capable of cutting at a high rate of speed, and the cuts may be coarser than those ordinarily taken. When the swivel tool holders were first used When the swivel tool-holders were first used on planing machines, cutting slots I inch broad into solid castings, it was found that two teeth of the feed could be used at each stroke. Previously, a forged tool of the same breadth, ground to form by the planer to the best of his ability, had been used in the same machines; but he found on trial from time to time that it was impossible to use more than one tooth of the feed—or, in other words, the tool-holder cut a given other words, the tool-holder cut a given depth into the metal in half the time of the forged tool.

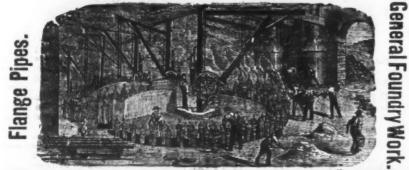
Again, when the swivel tool-holders were first used in cutting square-threaded screws, the utmost the lathe could do with forged tools was to take 4° of feed at each cut, as indicated by the micrometer feed-wheel. The tool-holder, on the other hand, took 7° feed in the same lathe, doing the same work, and producing quite as good or better finish with the same averagitims of a better finish with the same expenditure of steam-power. The cutters for the swivel tool-holders cannot only be made at the outset, but also constantly maintained, at the best and most efficient angles which practice can teach; it therefore follows that a very much better class of machine-work can be produced. The finished surfaces obtained from the tool-holders show a striking superi-ority over those from forged tools, especially when in the latter the angles are ground by hand, by each man or boy working a machine. The tendency then is to grind the cutters to all sorts of incorrect forms, which more or less tear the surfaces of the ma chined work, and leave bad finishes, such as require a considerable amount of hand labor bestowed upon them afterward, in filling, scraping and polishing. Again, the toolholders have led up to a considerable extension of what is called broad finishing, in planing, turning, shaping, slotting, &c

Broad-cutting feeds, varying from 1/2 inches in width, are very commonly taken by the swivel tool holders, and more accurate surfaces produced than with finer feeds. The advantages in point of time saved are very great, the time accupied in finishing by broad-cutting being from one-twelfth to one-twentieth of that consumed by finishing with ordinary feeds and in the usual manner. Some samples of this kind of finishing lie on the table, together with the cutter which was used. The width of broad-cutting can be increased to any desired limit, and there have been special cases where it has straight or true cutting edge, the best plan, of course, being to do this by mechanical means. 2. The securing a sufficient stability in the machine tool to hold the broad cutter so rigidly up to its work that neither the cutter itself nor the work may spring away, and that no jarring or injurious vibration may be produced and impart its ill effect to the finished surface. 3. The securing of sufficiently accurate work to answer the purpose for which it may be required—for instance, the piece of work planed or turned by this process may be a portion of a large railway bridge, where absolute accuracy is not required, or it may be some portion of a machine tool, where the utmost accuracy is needed, or, again, some portion of an engine, when the builder is anxious to obtain all the accuracy which can possibly be produced direct from the machine tool.

During the last 30 years many attempt have been made to introduce a better system mitted. Many engineers have used square

H. McNEAL,

BURLINGTON, N. J.



FOR WATER AND GAS.

RSTABLISHED IN 1848. SINGER. Limited,

PITTSBURGH, PA. MANUFACTURERS OF ALL KINDS OF

HAMMERED AND ROLLED

Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives Cold-Chisels and Machinists Tools generally. SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,

Stamping Cold, &c., &c. SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Bollers, Fire-Boxes, Smoke Stacks, Tanks, &c. l our Plate and Sheet Steal being rolled by a Patented Improvement is unequaled for surface exactness of gange.

ROUND MACHINERY CAST STEEL For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hos, Bake, E. B. Frog, Toe-Oalk, Sleigh-Shos and Tire Steel, &c.;

Oast and German Spring and Plow Steel.

Finished Bolling Plew Coulters with Patent Screw
Agricultural Steel cut to any pattern desired.

Bisel Forgings made to order.

Represented at 59 Beckman St., New York, and 417 Commerce St., Philadelphia, by HOGAN & SON, General Agents for Eastern and New England States.

MIDVALE STEEL COMPANY CRUCIBLE AND OPEN-HEARTH STEEL.

TIRES and AXLES



12 N. 5th St., Philadelphia, Pa.

Nicetown, Philadelphia, Pa.

THE PHILADELPHIA STEEL FORGE, Office, Frankford, Philadelphia, Pa. Air Furnace Process. Quality Guaranteed. Send for Estimate GENERAL WESTERN AGENT CHAS I. WICKERSHAM & CO., No. 232 Lake Street, Ohicago.

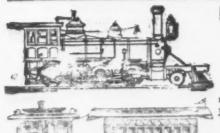
> ESTABLISHED 1847. A. WHITNEY & SONS, PHILADELPHIA,

CHILLED RAILROAD WHEELS For every kind of service, including Street, Mine and Lumber Tramweye. Wheels furnished in rough bored or on axies. Chilled castings made to order.

PENNSYLVANIA STEEL COMPANY, Steel Rails, Frogs, Crossings & Switches.

Forgings for Piston Bods, Guide Bors, Wrist Pins and Machinery Purposes
Works at Baldwin Station, Pennsylvania Railroad, near Harrisburg, Pa.
Address a orders to

PENNSYLVANIA STEEL COMPANY, 208 South Fourth Street, Philadelphia.



BALDWIN LOCOMOTIVE WORKS

BURNHAM, PARRY, WILLIAMS & CO., Proprietors, Philadelphia, Pa., U. S. A.

Manufacturers of LOCOMOTIVE ENGINES

of every Description.

Catalogues, photographs and estimates fur nished on application of customers. NOISELESS STEAM MOTORS, For city and suburban Rallways.

These machines are nearly noiseless in operation; show no smoke with the use of anthracite coal or coke as fuel, and show no steam whatever under ordinary conditions of service. They can be run at two or three times the speed of horse-case and draw additional. Circulars with full particulars supplied.

ROANE IRON COMPANY.

Pig and Railroad Iron.

CHATTANOOGA,

L. HERNSHEIM, Manufacturers' Agent and Commission Merchant, No. 20 Nassau St., NEW YORK. STEEL RAILS, BLOOMS AND WIRE RODS

Bessemer, Scotch and Charcoal Pig Iron, FERROMANGANESE, SPIECEL IRON, SCRAP IRON, &c., &c.

BRITTON IRON AND STEEL CO., MANUFACTURERS OF

IRON AND STEEL BOILER PLATE. Tank, Bridge and Ship Plates,

BLACK AND GALVANIZED SHEET IRON. CLEVELAND, O. Works foot of Wason St., cor. L. S. & M. S. R. R.,

Manufacturers of
Fayette Pig Iron (L. S. Charcoal),
Stewart Pig Iron (Bituminous Coal and Coke),
Also, Hammered Blooms, Billets and Muck Bar, extra low in phosphorus, for Siemens-Martin and ugible Steel. Miners of Jackson (Lake Superior) Iron Ores.

HARVEY H. BROWN, Asst. Gen. Agent.

Offices, 130 Water St.

HARVEY H. BROWN & CO.,

AGENTS

CHAMPION IRON CO., LAKE SUPERIOR IRON CO. } Lake Superior Iron Ores. Dealers in Pig Iron, Iron Ores and Old Rails.

Grand Arcade Building, 101 St. Clair St., CLEVELAND, OHIO. JOHN W. BUNN, Vice-President. CHARLES RIDGLEY. President. WM. BARRET RIDGELY, Assistant Secretary. GEO. M. BRINKERHOFF, Secretary

CO., IRON SPRINGFIELD MANUFACTURERS OF

IRON AND OPEN-HEARTH STEEL,

Ingots, Blooms, Billets, Boiler Plate, Spring, Tire, Machinery and Agricultural Steels of all Shapes and Sizes.

WORKS AND GENERAL OFFICES:

SPRINGFIELD, ILL.

Chicago Office: 111 DEARBORN ST. New York Office: 30 PINE ST.

CHARLES HUBBARD, 46 Cliff St., New York City, HEAVY STEEL AND IRON FORGINGS. For Marine and Stationary Engines.

Homogeneous Steel Boiler Plate, "Nashua" Brand. Best YORKSHIRE BAR, "TAYLOR" IRON, for Stamped Work, Screws, etc., etc. MUSHET SPECIAL TOOL STEEL, requires neither tempering nor hardening. Estimates given.

ESTABLISHED 1861.

City Steel Works. Jersey

JAS. R. THOMPSON & CO., Manufacturers of all descriptions of

TEE

Warehouse, 93 John Street, New York. THOS. C. BURROWS, AGENT.

IRON AND STEEL DROP FORCINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders', and Plasterers' Tools, Saddlers' Round and Head Knives.

WILLIAM ROSE & BROS., 36th & Filbert Sts., West Philadelphia.

MALLEABLE IRON CASTINGS TO ORDER.

SPECIALTIES IN SADDLERY and WAGON HARDWARE,

YOUNGSTOWN MALLEABLE IRON COMPANY, YOUNGSTOWN, Ohio. BIRMINGHAM ROLLING MILL CO.,

MANUFACTURERS OF

BAR, BAND AND HOOP IRON.

T-RAILS AND SPLICE BARS.

Also, Street and Tram Rails.

Birmingham, Alabama. Head Office, Louisville, Ky.

We solicit inquiries for Bar Iron and small Rails. Orders filled promptly.

OPEN HEARTH STEEL, PIC METAL,

MERCHANT BAR, IRON AND NAILS, Offices, First National Bank Building, Chicago, Ill.

C. R. CUMMINGS, President.
D. C. BRADLEY, Vice Pres. and Gen'l Man.
J. M. BROWN, Sec'y & Treas.

Works at Cummings,
Cook County, Ill.

CHEMICALS AND APPARATUS FOR THE ANALYSIS OF ORES, IRON, STEEL, FUEL, FLUXES, FURNACE GASES, &c., BRASS, BRONZE, SPELTER AND

Our Specialty. Being direct Importers and Manufacturers we can offer superior inducements, EIMER & AMEND, \ Nos. 205 to 211 Third Avenue. NEW YORK.

Eighteenth Street Station Elevated R. R. Hinstrated Cutalogue Matled on Application

CHAS. G. LUNDELL No. 7 Exchange Place BOSTON Ekman & Co., COTHENBURG. SWEDEN.

WROUGHT IRON Boiler Tubes,

Steam, Gas and Water Pipe.

Oil Well Tubing, Casing and

LINE PIPE. Cotton Presses, Forgings, ROLLING MILL AND

General Machinery.

READING IRON WORKS.

261 S. Fourth St. Philadelphia.

U. S. PATENT FOR SALE Of a new Bracket for Shafting, successfully intro-duced in England, under the title of

THE "SHAFT CARRIER." First offered in November, 1881, it has already been adopted by many eminent firms. Numerous testimonials, repeated orders and an ingreasing sale prove its superiority.

Sales in the Year 1882 Exceed \$5000.



A MODEL AT INVESTORS INSTITUTE, NEW YORK. For prices and further particulars apply to

TAYLOR & CHALLEN, Engineers, BIRMINGHAM, ENGLAND.





BASE BALLS, BATS,

UNIFORM MANUFACTURERS. ague and Association Balls, and all Or ishing Tackle, Tents, Gymnasium Goo Canoes, Seine Makers, The Rink Roll Skates, Saddle Bags, and Leggins Makers 166 Main Street, CINCINNATI, OHIO, B. KITTREDCE & CO.



COOK & WILSON.

GERMAN SILVER CASTINGS.

METAL PATTERN MAKING A SPECIALTY. 504 West Street, NEW YORK.

Hamm

SILVER & DEMING MFG. CO.,



Write for Catalogue and Prices. SILVER & DEMING MFG. CO.,





4 949 Pearl St.





Clock Springs and Small Springs BRISTOL, CONN.

Schenectady Molding Sand Co.

ALBANY AND SCHENECTADY MOLDING SAND
delivered on cars or boats at low rates. All grades
guaranteed. All orders will receive prompt attention. Address, J. G. GHEBENE, Sec.,
22 Wall St., SCHEMECTALY, N. Y.
G. S. VEEDER, Pres; J. G. GREENE, Sec. and Treas.

CLOTHES WRINGERS.



T. J. ALEXANDER, Manager, BOSTON, MASS.

WILLIAMSPORT SAW WORKS. SELF-STRAINING. BEST AND CHEAPEST.

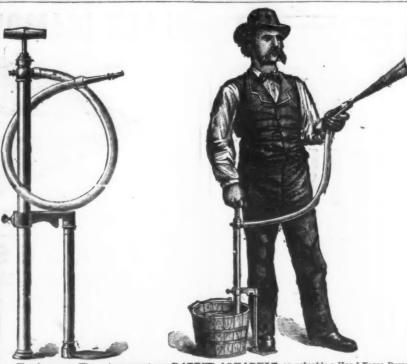




HAMMER HANDLES.

Hammer and Hatchet Handles for Tool Makers.

S. MUSSELMAN & SON, QUAKERTOWN, PA., U. S. A.



The above cuts (Fig. 259) represent our **PATENT AQUAL** t certain competitors have made bold to infringe on same, at in using our cuts and trade-mark name of article to decoyed invention; and we caution the trade and customers against ourselves, as we intend to protect our rights under our paten ar **PATENT AQUAPULT**, so valuable a Hand Force Pump to infringe on same, and even to resort to the crime of plagiar-ne of article to decoy customers away from our manufacture

oy ourselves, as we intend to protect our rights under our patent.

The weake the original and first inventors of this style of pump, and hold valid letters patent on same, and any statement that it had been in the market previous to our manufacture of same is of course absurb and without the SLIGHTEST FOUNDATION IN TRUTH.

W. & B. DOUGLAS, Middletown, Conn.

85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.



SKINNER'S PATENT COMBINATION CHUCK,

Plain and Ornamental Butts, Single and Double Acting Spring Hinges, Union Coll Door Springs, Galvanized Pump Chain, Patent Rubber Buckets, Wooden Well Curbs, Wood Tubing,

Iron and Brass Pumps, Patent Copper Pumps, Hydraulic Rams, Power Pumps, &c., &c., &c.

FIG. 114 REPRESENTS OUR

Force Pump. Hand It is made of brass, is strong and light, and is the best pump of its kind in the market. Write for prices.

UNION MANUFACTURING CO.,

Warehouse, 96 Chambers St., New York. NEW BRITAIN, CONN.

CUT NAILS, BAR IRON.

Address R. E. BLANKENSHIP.

RICHMOND, VA.

GEORGE BROOKE, President.

GEO. W. HARRISON, Treasurer.

THE E. & G. BROOKE IRON Birdsboro, Berks Co., Pa.,

ANCHOR BRAND

Capacity 1000 Kegs per Day. Made from their own Pig Iron, insuring regularity and superiority in quality. Also, FOUNDRY AND FORGE

PIG IRON, And Cold Blast Charcoal Car Wheel Iron.

NATIONAL HARDWARE & MALLEABLE IRON WORKS, in other words, if the power at 1 foot from the spot be represented by 1,000,000, at the distance of 100 feet it will be but 1. It is

THOMAS DEVLIN & CO.,

MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line of Carriage and Wagon Castings constantly on hand for the trade.

S. CHENEY & SON. MANLIUS, N. Y. MANUFACTURERS OF LIGHT AND MEDIUM WEIGHT

GRAY IRON CASTINGS, METAL PATTERN MAKERS AND JAPANNERS.

BRIDGEWATERIRON CO., Bridgewater, Mass.

Manufacturers of

Manufac

SEAMLESS DRAWN BRASS & COPPER TUBES, CUT NAILS, HORSE NAILS, FORGINGS, &c. NATUS, HURSE NATUS, FURGINOS, &c.

NAHUM STETSON, Jr., Agent, 73 Pearl Street, New York.

Inc. Date Processed to personal injury.

Vague statements have been made from time to time, promulgated to induce the total cost of the material variety of water

bar steel, which the blacksmith has twisted and then flattened at one end to form a drill. The object of the twisted stem was to screw the cuttings out of the hole, and to some ex-The object of the twisted stem was to screw the cuttings out of the hole, and to some extent this succeeded, but not perfectly. The twisted square section revolving in the round hole had a tendency to crush or grind up the cuttings, and if they were once reduced to powder it was difficult (especially in drilling vertically) for the drill to lift the powdered metal out of the hole. In most cases the lips of these drills were of such form that the cutting angle, or face of each lip, which ought to have been about 60°, was 90°, or even to have been about 60°, was 90°, or even still more obtuse, this being an angle which

For a short time lips thus formed cut fairly well, but a very small amount of regrinding soon put them out of shape, and made them of such obtuse cutting angles that good results could no longer be expected from them, and to be constantly sending such drills to the jobbing or tool smith, and then to the fitter to file into form again before they were rehardened, was found to be too tedious and too expensive. Again, to arrive at the best results in drilling, each of the cutting lips should make the same angle with a central line taken through the body of the drill; in other words, the angles should each have exactly the same number of degrees, say 60°. The clearance angles also should be identical, and the leading point should form the exact center point of the drill. From practice it is found that if these proportions are not correct, the drill cannot pierce the metal it is drilling at more than about half the proper speed, and the hole produced will also be larger than the drill itself, as will be exemplified a little later on. To give an idea of the should and use. The power given above to handle and use. The power given above is comparatively insignificant, and as it is to handle and use. The power given above is comparatively insignificant, and as it is the maximum effect that could be produced under the most favorable circumstances on the very spot of explosion, it never could be to say, as was said the other day in a London paper, that the explosion of such a quantity of nitro-glycerine would blow up the world of London. In fact, the explosion could scarcely be heard over London, and the damage done by it would be strictly coal. I have often, by way of experiment, exploded one pound of dynamite reduces the power given above is comparatively insignificant, and as it is to handle and use. The power given above is comparatively insignificant, and as it is the maximum effect that could be produced under the most favorable circumstances on the very spot of explosion, it never could be obtained in practice. It plified a little later on. To give an idea of the excessive accuracy which must be imparted to a twist drill, we must bear in mind that even a good feed is only 1-100th inch to each revolution, and as two lips are emeach lip has only half that quantity to cut, or 1-200th inch. This 1-200th inch is as much as can be taken in practice by each lip

in drills of ordinary sizes.

It will therefore be readily understood that if one lip of a drill stands before the other to the extent of I-moth inch only, the prominent lip, or portion of a lip, will have to remove the whole thickness of the metal from the hole at each turn. The lip of a from the hole at each turn. The lip of a drill will not stand such treatment, and it is therefore obvious that if this were attempted the prominent lip would either break or become too rapidly blunted. To get over these difficulties, the driller would no doubt reduce his feed by one-half, or to I-200th inch per turn, which would mean about half the number of holes drilled in a given time. This nice accuracy, although absolutely required, cannot be produced by hand-grinding; neither can a common drill, having a rough black stem more or less eccentric, be ground accurately, even by aid eccentric, be ground accurately, even by aid of a grinding machine with mechanism for holding it. To grind any drill accurately, it must be concentric and perfectly true throughout with the shank, as that part has to be held by the drill-grinding machine. If the drilling is to be done in the most rapid manner—in other words, at the smallest cost
—and if the best class of work is also desired. it seems certain that a twist drill, with all the accuracy which can possibly be imparted to it in its manufacture, and the greatest care employed in the resharpening, is the only instrument which can be employed.

(To be continued.)

The Power of Explosives.

The following, by Mr. Geo. M. Roberts, technical manager for Nobel's Explosives Co., Limited, of England, conveys informa-

Co., Limited, of England, conveys information of general interest:

Nitro-glycerine and dynamite do not, when exploded, exert such a force as is popularly believed. To speak precisely, the power developed by the explosion of a ton of dynamite is equal to 45.675 tons raised I foot, or 45,675 foot-tons. One ton of nitro-glycerine similarly exploded will exert a power of 64,-452 foot-tons, and I ton of blasting gelatine, similarly exploded. 71.050 foot-tons. These similarly exploded, 71,050 foot-tons. These figures, although large, are not enormous, and need not excite terror. Seventy-one thousand tons of ordinary building-stone, if arranged in the form of a cube, would measure only 96 feet on the side, and if it were possible to concentrate the whole force of a possible to concentrate the whole force of a ton of blasting gelatine at the moment of explosion on such mass, the only effect would be to lift it to the hight of a foot. The foregoing figures are derived from experiments made at Ardeer with an instrument which gives accurate results in measuring the force of explosives. The power exerted on surrounding objects by an explosion is in the inverse ratio of the cube of the distance from the point of explosion. Thus, at 100 feet from the exact point of an explosion the power is only the cube of I-100th, or I-1,000,000th part of what it is at a distance of only I foot from that point; or, thus seen that the effects are intense locally, but comparatively trifling at even short distances. If a ton of dynamite or nitro-gly-cerine were exploded in a London street the effects would be felt severely in the immediate neighborhood only of the explosion, and beyond that they would be confined to the mere breakage of windows. Indeed, it would be impossible by a single explosion, however large, to do damage to any considerable extent beyond the immediate neigh-berhood in which the explosion took place. On one occasion I happened to witness the explosion of over a ton of nitro-glycerine from a distance of only 60 yards. The nitrothe surrounding buildings there was no damage done. A little sand was thrown over me, but I received no personal injury.

belief that there are stronger explosives than nitro-glycerine and nitro-glycerine preparations, and that the wretched men ploaves yet known. The strongest of these is the material known as blasting gelatine. It consists of nitro-glycerine combined with a certain proportion of nitrated cotton. It is much more difficult to prepare than either to have been about 60°, was 90°, or even still more obtuse, this being an angle which would scrape only, but could hardly be expected to cut sweetly or rapidly.

Again, there were attempts to make the cutting angles of the two lips of much the same number of degrees as that given by the twist itself in a good twist drill. This was done by forging or filing a semicircular or curved groove on the lower face of each lip.

For a short time lips thus formed cut fairly well, but a very small amount of regrinding soon put them out of shape, and made them. end of the rod was always left uninjured.

English Iron and Steel Shipbuilding In 1882.

Recent statistics obtained from the local Recent statistics obtained from the local centers of the British shipbuilding trade fully illustrate the rapid growth which is being recorded in that line. The returns for the year 1882, for example, show an increase of over 200,000 tons, as compared with those of the preceding year, an increase in tonnage being apparent in almost every port. Altogether the number of iron and steel vessels constructed in 1882 was 796, the average tonnage being 1558 tons per vessel. The total number of wooden vessels launched during the same time was 123, and the aggregate tonnage was 44.217 tons, giving aggregate tonnage was 44,217 tons, giving an average of 359 tons per vessel. Eliminating the wooden vessels from the total, the ing the wooden vessels from the total, the average tonnage of the iron and steel vessels constructed in 1882 would be raised from 1858 to 1778 tons. Reviewing the table of the gross shipbuilding tonnage, we find the number, tonnage and average size of vessels launched in the principal shipbuilding rivers in 1882 to be as follows:

River.	No. of vessels launched.	Total gross tonnage.	Av. tounage per vessel.
The Clyde	201	391,934	1,346
The Wear	123	212,454	1,727
he Tyne	133	208,400	1,579
The Tees	40	65,048	1,626
The Mersey	33	47,887	2,176
fartlepools	39	68,067	1.745

Comparison of the figures for Great Britain with those of other countries, as may be seen from the appended table, yields interesting

Country.	Iron	Iron Vessels.	Steel	Steel Vessels.	Woo	Wooden Ves- sels.	Total	
	No.	Tons.	No.	Tons.	No.	Tons.	of all Vessels.	
ireat Britain	80 10	976,523	68	135,066	123	44,217	1,155,826	
rermany	8	67.873			280	8,235	76,108	
rance	in in	41,501	* *		3.6	8,350	43,921	
nited States	3.3	25,865	×	*****	33	35,018	10,277	
weden	200	161.6	26	944	6	2,774	12,900	
ushria	par i	2,549	26	5.475	940	163	8,207	
benmark	0	20,352	**		9	512	11,194	
selgium	0	3,127		0 0 0	3	500	3,350	
tally	256	129	**	****	1.2	6,899	7,028	
tolland	7	3,802	×	£,504	4.0		3,000	
ussia	**	404	**	*****	22	2,502	5,300	
ortugal			**	801.00	Del .	902	200	
orway	perj	1,559	**	*****	4	2,068	4.657	
Leece	**		:	*****	(5)	8,0005	1,725	
Total	308	1,142,595	73	143,009	254	107.492	1,393,195	
*								

Gran Bee Bee Germany, which comes next in impor-tance to Great Britain, has a total of only 76,108 tons, or about 5.4 per cent. of the whole, against 1,155,826 tons, or 8.3 per whole, against 1,155,320 tons, or 8.3 per cent. in Great Britain. The figures for steel shipbuilding alone even more strikingly establish this preponderance of the latter country. It will be noted that of the 1,43,000 tons constructed, not less than 135,086 tons were built in Great Britain, Austria coming next, with 5,475 tous, while the tonnage of iron ships constructed in different countries of Europe and in the United States was only 166,172 tons, against Great Britain's 976,523

The consumption of iron and steel in the British shipbuilding trade during the year considered amounted to approximately 723,-230 tons, the data being furnished by a leading firm of shipbuilders. This amount, it is estimated, was distributed as follows:

-	Plates, angles and bulbs	Tons, 650, 380
1	Riveta	14.410
1	Slip iron	
1	Foreign	9.610
J	Forgings	12:710
1	Total	783,230
1	According to figures given in the	eport,

AUBURN FILE WORKS. Superior Hand-Cut

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED. **FULLER BROS., Sole Agents,**

97 Chambers and 81 Reade Streets, N. Y.



McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS

Philadelphia, Pa., U. S.



sufacture and keep in stock a full line of **FILES** and **HASPS** only, for which we claim vantages over the ordinary goods, and ask domestic and foreign buyers to allow us to comerce trade. Superiority acknowledged wherever used, sold or exhibited.

DETROIT FILE WORKS. DETROIT, MICH.

The Largest Hand File Works in the U. S.

Manufacturers of FILES AND RASPS. SEND FOR CATALOGUE.

Proprietors: ROWE & HAYES, Detroit, Mich.

FILE MFG. CO., West Chelmsford Mass.

EQUAL TO THE BEST.

Send for Prices.

& HAINES, GRAHAM

113 Chambers and 95 Reade Streets, New York.

HARDWARE MANUFACTUR
WARD BROS., Cotton, Woo'l and Curry Cards.
1270 FORE MILLS, Steel Forks, Rakes, Hoes, &c.
KRICKERBACKEY, Scythes, Axes & Tools.
1270 FORE MILLS, Steel Forks, Rakes, Hoes, &c.
1270 TOOL WORKS (Limited), Vises, Picks, Mattocks, Grub Hoes, &c.
1201 HOCS, WORKS, Tackle B'ocks.
1271 KOLOK WORKS, Tackle B'ocks.
1271 KOLOK WORKS, Tackle B'ocks.
1271 CASTER CO., Martin # Patent Caster.
1272 CO., Martin # Patent Caster.
1272 CO., Martin # Patent Caster.
1273 CO., Locks, &c.
1274 Co., Holder Lang Tapes.
1274 Martin Honse Nail. Co., Horse Nails.
1274 Cors & Co., Cocks Genuine Screw Wrenches.
1274 HOWELL, Laundry Irons.
1275 Cow Mys. Co., Butter and Flour Tryers, &s.
1275 HANIS FADLECKS. , H. HOWELL, LAURITY FORS. DOWNOR MFG. Co., Butter and ANI INAVIAN PADLOCKS. EST OF ALL EGG-BEATERS. D'LEY MFG. Co., MOUSE Traps.

HARDWARE MANUFACTURERS' AGESTS AS FOLLOWS:

n. Wool and Curry Cards.
e Snaths.
teel Forks. Rakes. Hoes, &c.
tythes, Axes & Tools.
smmers.
st. Claimited), Vises, Picks, Matke.
c. Tackle B'ocks.
fartin #Patent Caster.
o. Co., Locks, &c.
patent B'arent Caster.
c. Co., Locks, &c.
c. S. Tackle B'ocks.
c. Caster Biols.
c. Caster Biol.
c. Caster Bio

LOWE'S METALLIC PAINT CO.,

CHATTANOOGA, TENN., OFFER TO CONSUMERS

THE BEST METALLIC PAINT MANUFACTURED IN THE UNITEDISTATES



ive OVER 1000 CERTIFICATES from Railroad Officers, Wagon and Agricultural Imple t Furnaces. We guarantee IT TAKES 25 PER CENT. LESS OIL, has more body and better ring properties than any other metallic paint.

For sale by the principal paint dealers and hardware merchants in the United States.

Armstrong's Improved Adjustable Stock and Dies FOR PIPE AND BOLTS.



Tapped to the U.S. and Whitworth Standard Gauges. Adjustable to all variations in the size of lags. Can be resharpened without drawing the temper by simply grinding them. Possessing practical advantages appreciated by all mechanics. Circular and Price List sent free on application.

Manufactured by F. ARMSTRONG, 30 Sterling St. Bridgeport, Conn



CLEVELAND IRON ORE PAINT COMPANY.

PURE IRON ORE PAINTS, Red (Rossie) Purple and Brown.
We guarantee all our Paints, and respectfully solicit the patronage of consumers and IRON PAINT.

New York Salesroom, 116 Chambers Street. AMERICAN TACK CO., Fairhaven; Mass.

Bandsaw Files, Boot Heel, Brass.

Cabinet, Cant. Cotter Taper, Cotter Equaling, Cross or Crossing,

Doctor, Drill, Feather Edge, Finishing,

Flat, Flat Equaling, Flat Wood, Gang-Edger, Ginsaw, Gulleting, Half-Round,

Half Round Wood, Hand, Hand Equaling, Handsaw Blunt, Handsaw (Double-Ender), Handsaw Taper, single-cut, Handsaw Taper, double-cut, Handsaw Taper, slim,

High Back, Hook-Tooth, Knife, Knife Blunt, Lead Float, Lightning, Machine Mul,

Mill, Mill Blunt, Mill Pointing, Pillar,

Pitsaw, Reaper, Roller, Round,

Round Blunt, Slotting, Slim Handsaw Taper, Square, Square Blunt,

Square Equaling Files, Stave Saw, Three-Square Files. Three-Square Blunt Files, Tumbler Files,

Union Cut, Warding Files, Warding Blunt File, Warding Round Edge File.

RASPS.

Baker's, Beveled Edge, Bread,

Cabinet, File, Flat and Half-Round, Flat Shoe, Flat Wood,

Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged, Horse Mouth,

Jig, Oval or French Shoe, Racer, Plain and Tanged.

SPECIALTIES.

Butchers' Steels, Improved, Bent Rifflers, Handled, File Cards, File Brushes, Machinists' Scrapers, Stub Files & Holder, Detack-Surface File Holder, Vise File Holder.

NICHOLSON PROVIDENCE.

R. I., SOLE MANUFACTURERS.

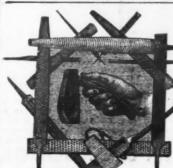
BLACK DIAMOND FILE WORKS



G. & H. Barnett, 21 to 43 Richmond St., Philadelphia.

CHARLES B. PAU

Manufacturer of HAND CUT FILES.



BALTIMORE, MD., Manufacturers of

Made from the Best Refined Cast Steel.

With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction. MORITZ & KEIDEL, Agents,

THRIFT FILE WORKS, Files.



No. 1 Commercial Street, Newark, N. J.

Dinner Pall and Lantern. most perfect Dinver Pail world. Hos coffee for and a Lantern at night. efactured by JOS. HAIGHT, PORT CHESTFE. N. Y lent by express on receips of on. Agenis wanted.

STOVE REPAIRS.

go, Milwaukee and chewhere, at W. C. WETZNER, 137 W. Randolph St. Chicago, III.

HELLER & BROS., Newark, N. J.,

Celebrated Hand-Cut American HORSE RASPS AND FILES.



Nade of the best American Steel, and warranted to be unequaled in the market. For sale by Iron and Hardware dealers throughout the United States and Canada.

DODGE, HELLER & LYONS,

Manufacturers of all kinds of FINE CLAY CRUCIBLE CAST STEEL. ALSO OF DODGE'S PATENT

FORGING AND GRINDING MACHINES,

for forging and grinding most articles of tapering or otherwise irregular form. These machines have long been in use in this country and in Europe, and are unexcelled for perfection of work and labor

WORKS AT NEWARK, N. J.



M. KING do WATERFORD, N. Y., Manufacturers of the BUTTONS PATENT

CUTTER AND PLIER Specially Adapted for Use on Wire Fence

Also Manufacturers of Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps
Hand, Nut and Screw Taps, Ploe Taps and Reamers.
Price List on application.

Established by Darrie B. Kirse, 1840

LIMITED, MANUFACTURERS OF

SPRINGS AND For Coaches, Phaetons, Buggies, Wagons, &c.

Pittsburgh, Pa.

AXLES

MEDFOR

Works, Car

DO

Collars M

CELLUI

and the

Send :

M The only infacture of

101 Chami

SCALES

Of all Descriptions,



For Grocers' & Family Use

Manufactured by

JOHN CHATILLON & SONS,

89, 91, 93 Cliff Street, New York

Send for Illustrated Price List.

THE

Greenfield Vertical Engine



is unequaled by any other in workmanship and quality of material.

> 21/2 to 30 horse-power. Prices lower than any other first-class engine.

COOKE & CO. DEALERS IN MACHINERY SUPPLIES,

Cortlandt St. NEW YORK.

In writing, please mention this paper



Grant Fan Mill & Cradle Co

Grant's Grain, Coffee, Rice, Cochinea and Pimento Fans,



and
TURKET WING GRAIN CHADLES
4, 5 and 6 fingers.
GRAPE VINT GRAIN CHADLES
4 fingers.
SOUTHERIN PATTERIN GRAIN
CRADLES
4, 5 and 6 fingers.
All of a superior quality
None grounce unless market
Grant Fun Mill as d Cra lie Co
Sand for illustrated catalogue.

GEORGE W. BRUCE ATLANTIC SCREW WORKS,



33

5

Agent for the Florence Tack Co. and C. A. Maynard. AYNARD'S C. S. Plante's Hilling, Bog and Handled Planters, Cotton and Field Hoes.

BRADE'S Crown, Planters and Hilling.

ELWELL'S weeding, Planters' and Grub, and a variety of other kluds for Home and Export Trade.

ESTERBROOK'S STEEL PENS



Leading Numbers: 14, 048, 130, 333, 161. For Sale by all Stationers THE ESTERBROOK STEEL PER CO., Works, Camden, N J.

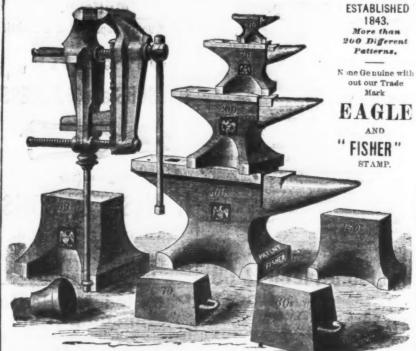
DOC COLLARS

MUZZLES. The only firm to the World who make the man-acture of Dog Collars and Furnishings a spec

Collars Made of Leather and Metal of all kinds,

and the only firm who manufacture the CELLULOID DOG COLLAR Send for Illustrated Catalogue 1883.

MEDFORD FANCY GOODS CO. 101 Chambers St., cor, Church, New York.



WARRANTED BETTER THAN THE BEST ENGLISH ANVIL! Face in one piece of BEST TOOL CAST STEEL, PERFECTLY WELDED, perfectly true, o lest temper and never to come off or "settle." Horn of tough untempered steel, never to break of the control of the contro

FISHER DOUBLE-SCREW VISE IS FULLY WARRANTED STRONGER THAN ANY OTHER LEG VISE, AND ALWAYS PARALLEL. Is the best Vise for Machine Shops and Blacksmiths, and for all heavy work. ACCURATE AND DURABLE, Send for Circular.

EAGLE ANVIL WORKS, Trenton, N. J.

RICHARD DUDGEON.

No. 24 Columbia Street, New York. Maker and Patentee of the improved Hydraulic Jacks Punches. Roller Tube Expanders and Direct Acting Steam Hammers Communications by letter will receive prompt attention.

Jacks for pressing on Car Wheels or Crank Pins made to orde THE ANSONIA CORRUGATED STOVE PLATFORM



With Patented O. G. Border. ROUND, SQUARE AND OB-LONG. IN ALL SIZES.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality

Send for List and Discount,

BRASS AND ANSONIA

PURE ELECTRIC WIRE

For Magnets, Telegraphs, Telephones, &c.
Insulated on the bare wire with H. Splitdorl's patented Liquid Insulation, covered with cotton or silk All sizes of Bare and Covered Wire in Stock. The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS. For Clocks, Indicators, Telephones, Call Bells, Bell Punches, Steamboat and Bailroad Uss. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York

THE ESSEX HORSE NAIL CO., Limited.

THE ESSEX HORSE NAILS pointed, rendering them both tough and stiff, and are warranted

Are drawn from the Best Norway Iron Rods only. They are hot forged and cold-FIRST-CLASS IN EVERY RESPECT.

By the use of improved machines we forge Fifty per cent. More Nails on a machine than any other company, and are thus enabled to sell them proportionately less than any other nail of equal quality. All nails branded ESSEX fully guaranteed.

HOWE & CO., Troy, N. Y.

Improved Carpenters' Tools.



PACTORIES New B itain, Conn. WAREROOMS, 29 Chambers St.,

New York. Manufacturers of Bailey's Patent Adjustable Planes.
General Agents for the sale of Leonard Halley & Co.'s "Victor Planes."
Manufacturers of "Defiance" Patent Adjustable Planes.

FOUNDRYMEN, ATTENTION! FOR THE

Aiken & Drummond Patent Power Molding Machines SEND FOR DESCRIPTIVE CIRCULAR TO

THE DRUMMOND MFG. CO., Louisville, Ky.

NOVELTY IRON FOUNDRY,

HAIGHT & CLARK,

fail to see any reason why charcoal produced in retorts cannot be made as heavy

MANUFACTURERS OF FINE GRAY IRON CASTINGS

OF EVERY DESCRIPTION.

Rosettes and Pickets for Wire Workers, Castings for Furniture and Plano Manufacturers. Iron and Metal Patterns of all kinds a specialty. Correspondence solicited.

JAPANNING. BRONZING. about \$23,614,405, from which, however, should be deducted 9 per cent. (or 65,090 tons) of scrap, valued at about \$1,139,075. If the same tonnage had been constructed in steel, the quantities that would have been steel, the quantities that would have been required are estimated at 629,300 tons, giving a net reduction of 93,930 tons on the quantity that would have been required had the same tonnage been built entirely of iron. The cost of the metal used per ton would, however, be advanced in the case of steel, the difference between the former and the latter in point of cost being about \$5,545,850 in favor of iron. In concluding, the following statement of the tennage of shipbuilding constructed in Great Britain from 1877 to 1882, with the quantities of iron and steel employed, may prove interesting

Year.		nnage of diffg con- l.	Quantity and stee	of iron
	In iron.	In steel.	Iron.	Steel.
	Tons.	Tons.	Tons.	Tons.
877	530,060	811.1	304.250	472
1878	478 000	9.516	274,850	3,852
1309	568.462	82,473	332,306	5,090
E 80	058,057	38,164	378,350	\$5,055
1881	941,675	71,533	541,375	30,420
1832	1,122, 97	127,927	664 120	53,080

In considering this table, it may be well to In considering this table, it may be well to bear in mind that according to a general assumption, a certain proportion of the material used in the so-called steel ships is iron, and on the authority of a prominent British shipbuilder, 16.7 per cent. has been assumed to be of this metal. Taken altogether, the particulars submitted in this section of the capacitant and are suggestive and well worthy of eport are suggestive and well worthy of close consideration,

The Beech for Charcoal.

Mr. B. E. Fernow, who has had a wide experience in connection with the manufacture of charcoal, writes as follows in a recent number of the Journal of the United States Association of Charcoal Iron Workers:

"When prospecting through West Virginia last fall, the writer found that the beech formed no inconsiderable portion of the woodlands, and that there, as in other localities, this tree is considered of inferior value, ities, this tree is considered of inferior value, and is hardly used even for fuel. This was the more astonishing, as in Germany the same beech vies among the forest trees for the second place in utility and value, the oak, of course, taking the first, and the pine (Scotch) ranking about even in significance with the beech. In fuel value the latter is considered second only to the oak, and for special uses, as mining timber, for wagonstock, for wooden-ware (especially odorless special uses, as mining timber, for wagonstock, for wooden-ware (especially odorless
butter tubs) and for many other manufactures it is second to none. As it will become
necessary in time in this country, too, to
study the capabilities of each tree species for
different purposes, in order to decide upon
the choice of those species from the many
which will best repay the planter or best suit
his purposes, the following notes on the
beech as a charcoal producer, published in a
recent German forestry journal, will be acecent German forestry journal, will be ac-

retorts, in connection with iron works, seem to find favor and the interest of charcoal ironworkers is thus drawn into the line of chemical works, it may be of interest shortly chemical works, it may be of interest shortly to describe the retorts in use for 10 years at the Freidrickshutte, in Hesse, for the purpose of making wood vinegar, the charcoal resulting from the process being used in the furnace. The retorts are simply boiler-like iron cylinders 3 feet in diameter and 9 feet long, horizontally placed in ovens like common flue boilers. In front is the door for charging, at the back the opening for the gases to escape into the condenser. Each cylinder contains a basket made of iron bars, for the purpose of quickly withdrawing the charcoal into an iron box, which, to effect gradual cooling, is covered with a lid made air-tight by the use of clay. There are 24 retorts in use, which produce yearly at least 1200 tons of beech charcoal. The wood used is made 3 feet long, and all dimensions, even

since one bushel (of 2748 cubic inches) of coal weighed so.38 pounds, one cord yielded 47.39 bushels. In the coalings in meilers the average result obtained in the same district, and with the same wood, was 41.3 bushels per cord, or 1094 pounds, which brings the weight of the bushel to 26.5 pounds (braize included). These comparative results, extending over a number of tive results, extending over a number of years, confirm that the specific weight of charcoal made in retorts is very much below that made in meilers, while the yield in vol-ume is in favor of the retort. The charcoal made of beech is a superior fuel for iron smelting; it was found that the working of the blast furnace was more regular with the the blast turnace was more regular with the distilled coal than that from the meiler, but to obtain the same results a greater volume of the former was necessary (which is easily explained from the difference in weight). In conclusion, it may be interesting to know that several thousand tons of beech charcoal are used annually in the distilleries of Europe, for the removal of the fusel oils, &c., as it forms a most excellent filter."

The Journal above quoted, in commenting upon Mr. Fernow's remarks, says:

"We are lost to question assertions made by one who, like Mr. Fernow, has had such varied experience, and one who has studied pose. In the manufacture of charcoal in re-ports the wood under carbonization is under but this is considered as the most langible,

nore complete control than that piled in neilers, and therefore any quality desired, or any especial degree of carbonization, hould be secured.

The retort coal may be injured in sevral ways, among which are: 1, too rapid charring; 2, too long-continued carboniza-tion; 3, striving for an excess of acetic vapors; 4, partial destruction of the coal vapors; 4, partial destruction of the coal after being placed in cooling tanks if they are not immediately sealed hermetically. By the setting of the retorts, as explained by Mr. Fernow, we fail to see how a uniform heat can be applied to the wood in them, and as a consequence the process is carried too far with part of the wood, thus reducing the density of the coal. A gentleman who has had large experience with retorts of similar form and setting to those described by ilar form and setting to those described by Mr. Fernow, stated to us that he had obtained 66 bushels of charbon-roux, but less than 55 bushels of charcoal, from a cord of wood placed in his retorts. Now, whatever shrinkage or contraction reduced the volume of wood placed in a retort had affected the mass by the time the wood had been sufficiently heated to produce brown charcoal (charbon-roux), and if the volume of black charcoal was appreciably less than that of the charbon-roux, the responsibility is upon either an improperly designed or injudi-ciously-set retort, or upon defective opera-

Railway Bridge Accidents.

Mr. P. A. Peterson, in the Canadian Mag azine of Science, has the following in regard to accidents upon railway bridges and some of the means that have been taken to avoid

The accidents that have occurred on this continent to iron railway bridges built within the last 15 years have not been the result either of faulty design or of weakness of the material used, and while so much is being constantly written about design, nature of strains, safe loads, factors of safety, &c., little or nothing has been urged as to the duty of protecting the bridge, after it has been well built, from the accidents caused by derailed trains, which experience has shown to be its greatest, if not its only, source of danger. A large percentage of railway bridges are so placed that all trains going toward them have to go down a grade and round a curve to reach them, and have another curve to go round and grade to ascend in getting away from them, and with heavy freight trains and light engines, drivers run very rapidly down the grade and hich will best repay the planter or best suit is purposes, the following notes on the sech as a charcoal producer, published in a cent German forestry journal, will be acted to the construction and use of Mathieu's torts, in connection with iron works, seem torts, in connection with iron works, seem and the interest of charcoal land and the has done his duty in the matter, and when one of the many things that may throw a freight train off the track at this speed happens, and pitches a locomotive or car into the end not of a bridge, knocking it out, and so throwing the bridge and train into the river, the bridge has to take the burden of the hame and is found fault with for not

lines rails running from a point in the center of the track about 100 feet from the end is made 3 feet long, and all dimensions, even stocks and roots, are used; the latter give of the bridge diverge gradually, till near the same quantity of distillates, but require longer time for charring than the ordinary cord wood. Each retort is charged with cord wood. Each retort is charged with about one-half cord split wood. Duration of process, 18 to 20 hours (formerly 12 to 14 hours, with less favorable results). Temperature about 25° C (482° F.) The cooling requires five hours. Each two retorts have one fireplace; coal, sawdust saturated with tar, and also those gases resulting from the process which cannot be condensed, are used for firing.

"One cord of beech-wood weighed 4092 pounds, and yielded in the average 966 pounds, and yielded in the average 966 pounds of good charcoal, or 23.6 per cent. in weight, the small braize not included. And since one bushel (of 2748 cubic inches) of coal weighed 20,38 pounds, one cord yielded to lift the wheels on the rails. This has been found very effectual, when the speed gaining ground, the Great Western Railway being the first to give a clear width of 20 feet between the inside of the trusses of its "through" bridges. In addition to this in-creased width, there should be some manner of more fully protecting the end posts, and the most ready method of accomplishing this seems to be by means of heavy masonry walls, laid in Portland cement and well doweled together, carried up 11 feet apart to the hight of an ordinary passenger car. While it cannot be said that these modifications and additions will prevent all accidents to bridges, yet it must be admitted that they will go a great way toward it, and in such an important matter all that can be done should be done.

> Investigations have been made of the cause of weakness in the parts of the St. Gothard tunnel where the vaults were crushed, and it is thought that the accident must be attributed to the action of damp air upon the shists and gneiss, and to the decomposition which resulted therefrom. The presence of anhydrous sulphate of lime, or karstenite, was also an important agency its transformation into gypsum being fol-owed by a disaggregation which renders the rock incapable of sustaining its pressure Other hypotheses have naturally been framed,

Cutlery.

WILSON'S JOHN CELEBRATED

NO ARTICLE MARKED "WILSON" IS GENUINE, UNLESS IT ALSO BEARS THE

TRADE MARK

FOUR PEPPERCORNS AND A DIAMONDA

GRANTED A.D. 1766 BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT. REGISTERED ALSO AT WASHINGTON, U.S. ACCORDING TO ACT OF CONGRESS.

ALSO AT LEIPZIG, IN ACCORDANCE WITH THE GERMAN TRADE MARKS' REGISTRATION ACT.

BUTCHERS' KNIVES. BUTCHERS' STEELS,

> SHOE KNIVES. INFRINGEMENT.-SPECIAL NOTICE.

It having come to the knowledge of JOHN WILS. N that Counterfeit Butchers' Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such impositions.

JOHN WILSON also hereby gives NOTICE, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark, and with that view he will handsomely reward anyone supplying such evidence as will lead to the conviction of the Makers and Vendors of the said Spurious Imitations.

WORKS:-SYCAMORE ST., SHEFFIELD, ENGLAND, Established 1750.

AMERICAN MADE RAZORS CUSHION BELT MBINATION-RAZOR STRO J. R. TORREY,

MANUFACTURER OF STROPS

To introduce we offer HOLLOW GROUND RAZORS
181. GEM RAZORS, 81.7, \$2.50. [VOF, \$3. All our own
strop warranted to the control of the control Factories at Worcester, Mass.

M. L. B. 1845.

J. R. TORREY RAZOR CO.,

BRADFORD & ANTHONY,

Importers, Manufacturers' Agents and Wholesale and THREE PRIZE MEDALS.

Retail Dealers in

Cutlery, Fancy Hardware,

SKATES AND FISHING TACKLE.

Sole selling agents for the United States for ENG-STHOM'S SWEDISH HAZORS.
Sole selling agents for the United States for Starr Manufacturing Co.'s ACME SKATES
Sole selling agents for BARBER BROS.'
Pocket Knives, Scissors.
Sole selling agents for BARBER BROS.'
Pocket Knives.
Sole selling agents for BARBER BROS.'
JOHN NOWILL & SONS' Scissors.
JOHN NOWILL & SONS' Scissors.
JAMES CHESTERMAN & CO.'S Meas-

Sole selling agents for WINSLOW'S POPU-LAR SINATES. Wood Tops, Clubs, All Clamps and Ladies' Skates. Sole selling agents for HOBT. MURPHY'S Corkscrews, Cyster Knives, Shoe Knives, Rubber Knives, Butter and Cheese Tryers and Steel

Implements.

Sole selling agents for **D ROBERTS'S** Nickel-Plated and Japanned Handle Shears and Scissors. tole seiling agents for New England for R. **E:N:180:**5 SONS' American shears. Scissors and Trimmers.

Scissors and Trimmers. ole selling agents for New England for the STAR SCISSORS COMPANY'S Nickel-Plated La dies' Scissors, Trimmers, &c.

JOHN RUSSELL CUTLERY CO.'S Table
Cutiery, Pocket Knives, Butchers', Painters',
Druggists' and Household Cutiery, Silver-Plated

JOSEPH ROGERS & SON'S Table Cutlery, Pocket Knives, Scissors, Razors, Erasers.

GEORGE WOSTENHOLM & SUN'S Celebrated IXL Pocket Knives, Razors, Farrier's

Kuives.

JONATHAN CHOOKES' Pocket Knives,

WADE & BUTCHERS' Celebrated Razors

FHEDERICK HEVNOLDS' RAZORS.

THOMAS B. CADMAN'S Bengal Razors. NEEDHAM BROTHERS' "Repeat" Pock-

Sole selling agents for NEW ENGLAND

KNIFE CO.'S Pocket Knives.

uring Tapes,
elling agents for WINSLOW'S VINEKARD ROLLER SKATES.
ole selling agents for New England for GOLDSCHMIDT'S HAZOR STRAPS.

Sole selling agents for UNITED STATES
FISH HOOK WORKS.
tole selling agents for the FISHING LINES
bearing the Trade Mark "Best Quality
Which received Centennial Medal for "strength
and care taken in wanningtes."

ole selling agents for the PATENT ADJUST-ABLE FLOATS AND SINKERS. elling agents for SKINNER'S CELE-BRATED TROLLING SPOONS. Importers of Calcutta and Japan Bamboo Poles, Fish Hooks, Swivels, Silver Fishing Gimp, Spanish Silk Worm Gut.

Gut.
Selling agents for the best manufacturers of
Jointed Fishing stods, Fishing
Reels, Braided Fishing Lines, Artificial Haits, Hammocks.
Selling agents for OLRY'S PATENT POCKET FLASKS.
List of Murphy's Steel Goods, Catalogues of our
Skates, Catalogues of our Fishing Tackle stock
will be mailed on application to dealers in these
lines of goods.

DAME, STODDARD & KENDALL,

374 WASHINGTON STREET.

BOSTON, MASS.

Western Office, 36 Sixth Street, Pittsburgh, Pa. BLAKE'S

BLAKE CRUSHER CO.,



Challenge Rock Breakers Patented Nov. 18, 1879.

See The Iron Age first issue of th

New Haven Conn.

Office of

PHŒNIX CASTER CO.,



Indianapolis, Ind.

MARTIN'S CASTER

For heavy bedsteads, book-cases, flower stands, refrigerators, safes, sideboards, desks, or very heavy furniture. Also for heavy ice chests, magazine boxes, stove trucks, heavy showcases, beer boxes, or any very heavy weight. Especially adapted for use in beer bottling, fruit canning, tobacco or warehouse establishments, where heavily loaded tables need to be moved.

Send for Catalogue.





Cutlery.



Joseph Rodgers & Sons CELEBRATED CUTLERY, No. 82 Chambers Street, New York

P. A. W. CLATWORTHY, Agents, The demand for Joseph Rodgers' & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam-power To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear

ESTABLISHED 1836.

their Corporate Mark.

93 Chambers and 75 Reade Streets,

NEW YORK,

SOLE AGENTS FOR Ely Bros., Caps, Wads, &c., Joseph Elliot & Sons, Razors, Isaac Greaves, Sheep Shears, &c.,

Robert Sorby & Sons, Sheep Shears, &c., Edward Elwell, Hoes, &c., R. & J. Linacre, Grass Hooks and Sickles, Webster & Horsfall Steel Wire, GENERAL AGENTS.

> Western File Co.'s American Files. WEADQUARTERS FOR

ANVILS CHAIN CUTLERY, CUNS, &c. &c., &c.



PARIS, 1878. 4 PARIS, 1855. MATTHIAS SPENCER & SONS, Albion Steel Works, Sheffield, MANUFACTURERS OF

FILES AND STEEL,

Table Knives, Razors, Shovels, &c., &c., of every description.

CORPORATE MARK

Granted 1749.

A. F. BANNISTER & CO. SUCCESSORS TO FURNESS, BANNISTER & CO.,

WANUFACTURERS OF. TABLE CUTLERY,

Cor. Nassau & Sheffield Sts., NEWARK, N. J.

ONEIDA ALARM TILL. SUSCEPTIBLE OF OVER 100 CHANGES. Better than any other Till in the market. No tempering with keys, as it alarms every time a key is outhed, unless acquainted with combination. Send for prices and compare this Till with others in the market. No Till-tapping possible.

THE ONEIDA ALARM TILL CO., EAST SYRACUSE, N. Y.

No. 182; Oblong Plate.

Cutlery.

Best Quality Japanned and Nickeled

SHEARS,

SCISSORS and PRUNERS



Manufactured by

26 Bank St., Newark, N. J.

FOR SALE BY ALL RELIABLE DEALERS. Send for New Catalogue.

Patented Articles of Malleable Iron.

Hammer's Malleable Iron Oilers. Three Sizes. Nos. 1, 2 & 3.



Hammer's Adjustable Clamps. Hammer's Mall. Iron Hand Lamps. Hammer's M. I. Hanging Lamps.

NEW pattern Heavy Screw strongest in the market. Clamps; For sale by all the principal Hardware Dealers Send for Price List. Malleable Iron Castings

of superior quality, and Hardware Spe Malleable Iron made to order HAMMER & CO., BRANFORD, CONN.

W. R. EYNON & SONS CLEVELAND, OHIO.,



MANUFACTURERS OF MACHINIST TOOLS, MILLING MACHINES.

Die Sinkers, Universal Heads, Index Centers, Universal Vises, Grinding Attachment for Lathes, Centering Machines. Gear Cutting and Milling Done. Office and Works, No. 73 Scranton Ave

MARTIN REYNOLDS. 354 Lorimer St., Brooklyn, E. D.,

Brass Smelter & Refiner ingot Brass for Car Bearings a specialty.

Brass washings for bell makers always on hand.



With Flush Handle and Adjust able Click. Sale by the Jobbing Trade Generally.

Send for Catalogue and Price List of SPLIT BAMBOO, JOINTED BAMBOO and WOOD RODS; REELS, ROD MOUNT-INGS, &c., &c.

FREDERICK MALLESON, Manufacturer, 136,138,140,142,144 First St.

Brooklyn, E. D., N. Y. PATENT



ASTERS.

from Fine Brass Furniture Casters to Heavy Truck Casters weighing 70 lbs. per set. These goods have proved their practical merits tor Furniture, 8000 sets being used last year by makers of Folding Beds alone.

Send for new catalogue,

PAYSON MFG. CO., Chicago,



The backstrale when the wreach is used is borne by the bar—not by the handle. The strongest Wrench made, and the only suc-cessful Re-enforced Bar. None genuine unless stamped

A. C. COES & CO.

Our Agents, GRAHAM & HAINES, 113 Chamber St., New York, carry a full line of our goods, as a will be pleased to serve you at factory prices.



December 28, 1875

HEDGE TRIMMER.

TREE AND

Unsurpassed for cheapness and durability. Unlike any other make, it combines a perfect lever principle with a blade working in a stated steel hook. Send for illustrated circular and price E. S. LEE & CO.,

164 West Main Street, ROCHESTER, N. Y.

GEO. H. CREED,

SHIP CHANDLERY, 103 Reade Street, New York, Manufacturers of and Wholesale Dealers in Cotton and "Long Flax" Sail Duck, Cotton and Linen Ravens, Creed's Patent Ships' Clews. Heltman's Wire Rope Spiloers. Agent for Raymond's American Crane On the Imbrication Culisders and Valves.

THE WIRE GOODS CO.

Worcester, Mass.,

SHARP GIMLET POINTED

WIRE GOODS. WIRE BENDING A SPECIALTY. Wire Straightened and Cut to

Length. RIFLE MANUFACTURERS.

GUN

PISTOLS.

American and English Goods. Fishing Tackle, Winchester and Other American Rifles. Manufacturers of Leather Gun Cases, Hol-sters, rays and Clothing of Leather and Duck.

Dealers who visit us will always find Job Lots.

166 Main St., CINCINNATI B. KITTREDGE & CO. SCROLL SAWS

The "Challenge" and "Rival" re the finest foot-power Scroil Saws a the world, with or without Lathe Price, \$10 to \$20. SENECA MFG. CO., Seneca Falls N. Y., U. S. John McLean,

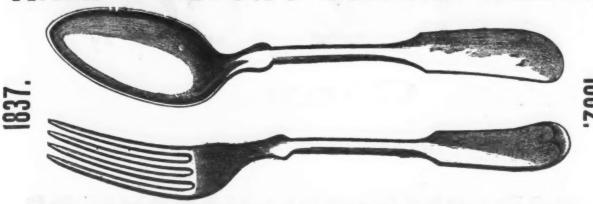


fied Cemetery Supplies. 29 & 300 Monroe St., N. Y. BARNES' SAWS. Complete Outfits for Workshop Business.

Lathes for Wood or Metal, at CHARLES E. LITTLE'S, (Eastern Agency, Factory Prices.)
59 FULTON ST., NEW YORK.

Descriptive Catalogue Free,

HALL & ELTON'S GERMAN SILVER.



In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

HALL, ELTON & CO., Wallingford, Conn., and 47 East 13th St., New York.

NEW YORK CLUB ROLLER SKATES.





This cut shows one of the skates twisted and bent cold.

The lightest, easiest working and most durable Roller Skate ever made. The frames are made from a fine quality of decarbonized steel, and cannot possibly be broken in using. The heel support is preferable to the ordinary one of leather, as it cannot wear through. Besides these, the skate has many other advantages, and the price is low as compared with others. Patented June 21, 1881.

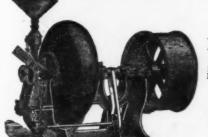
MANUFACTURED BY

A. SUTTON,

522, 524, 526, 528 and 530 West 20th Street,

- - - - NEW YORK.

CONTINENTAL WORKS



OMIZER Pulverizer, Mechanical A For reducing to an impalpable powder all kinds of hard and brittle substances, such as QUARTZ, EMERY, CORUNDUM, GOLD AND SILVER ORES, BARYTES, COAL, OCHRE, MANGANESE, IRON ORES.

PHOSPHATE ROCK, &c. It is simple and not liable to get out of order, Revolving Shell being constructed of Siemens-Martin steel, and all parts mechanical in design and of first-class construction. Weight, 5,500 lbs. heaviest piece, 1,500 lbs. It will pulverize 7 to 10 TONS IN 10 HOUES with 30 H. P.

For Circulars and full particulars, apply to or address THOS. F. ROWLAND, Sole Manufr, Brooklyn, N. Y.

PREPARED

Y,

25

ackle

Hol-

10.

IS

00.

alvan

iness

E'S

CLEVELAND, OHIO,

HOUSE PAINTS Color Makers, Varnish Makers,

PAINT MANUFACTURERS.

READY FOR USE.

Send for Sample Card and Catalogue

BILLINGS, TAYLOR & CO., HOWARD IRON WORKS,

BUFFALO, N. Y.,

Manufacturers of

WESTON'S PATENT SAFETY

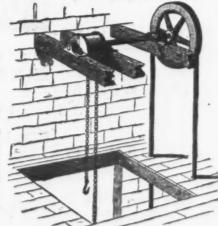


STORES,

FACTORIES, WAREHOUSES.

MILLS, &c.

Load always self-sustained. It can never "run down." Accidents impossible. As one hook ascends the other descends, and is thus ready for the next load. If the rope is let go, the load comes to rest immediately.



SOLE MAKERS:

THE YALE & TOWNE

MANUFACTURERS, ENGINEERS AND MACHINISTS STAMFORD, CONN.

Principal Office and Works,

SALESROOMS: NEW YORK, 62 Reade Street, BOSTON, 224 Franklin Street,

PHILADRLPHIA, 507 Market Street,

CHICAGO, 64 Lake Street.

40 Page Blustrated Catalogue of Light Holsting Machinery Sent on Application.

and Iron.

Mr. J. F. Barnaby, of the British Admiralty, recently submitted an interesting report giving the results of a series of experiments made at Sheffield, to ascertain the effect of repeated heating and cooling on the strength of different makes of iron and steel. The metals submitted to trial were Siemens, or open-hearth, steel, and Bessemer steel, of about the maximum and minimum strengths allowed by conditions of contract, and Bowling iron and iron of B. B. quality, as made by Messrs. Cammell & Co. for use in Her Majesty's service. In making the tests it was endeavored to subject the several samples, as far as possible, to treatment similar to that which they would receive if forming portions of a boiler in actual use. The appended table shows the average results of the tests of the higher strain Siemens and Bessemer plates and the B. B. iron plate. Each result is the average of four tests,

which are deduced from two experiments only. These show the normal tensile strengths and percentages of elongation of heated in a furnace arranged similarly to an oven, so that the heat should be uniform.

Effect of Repeated Heating on Steel General Dumont says that the agents of all the passenger lines of steamers have shown a commendable desire to comply with the new law, and have asked delay in its enforcement only in cases where it was found me-chanically impossible to comply with all its details in the short time allowed each vessel

SCIENTIFIC AND TECHNICAL.

An Artificial Aurora.

We had occasion a short time ago to submit some interesting particulars relating to an artificial aurora produced by Professor Lemstroem, and in this connection the fol-lowing, taken from a paper by Professor Foerster, the director of the observatory at Berlin, referring to the same subject, will prove acceptable. Previous observations at Spitzbergen had fully convinced the Professor, that the polar-light rays appear not only in the higher strata of rarefied air, but also sometimes below the clouds. He furtwo lengthwise of the plate and two across ther satisfied himself that electrical-light it, except those of the first horizontal line, ducing an abnormally great difference of potential between two points of the earth's surface. The two hills selected for the final strengths and percentages of elongation of the several plates, each 36 thick, from which the samples were out. In the second to the seventh lines, inclusive, are shown the per square inch and the elongative of the seventh lines, inclusive, are shown the per square inch and the elongative of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines, inclusive, are shown the lines of the seventh lines. insulated like telegraph wires. To those copper wires he soldered, at about 1½ feet apart, several hundreds of pointed metal rods fixed in a vertical position. Each system was connected to a zinc plate by means of They were exposed until they attained a heat of about 800° F., which was ascertained by withdrawing them and noting if small pieces of zinc would melt if placed upon them. They were then allowed to cool, and the process repeated 3, 8, 12, 20, 40 as connection between the wire system and and 60 times, as recorded in the table. The samples from which the tests shown in the positive electricity of varying intensities

TABLE SHOWING RESULTS OF TENSILE AND ELONGATION TESTS OF STEEL AND IRON AFTER VARIOUS MODES OF TREATMENT.

	OI	FIREAT	MENT.					
	Fleme Open-l Ste	nearth	Bessen	ner Steel er Plate.	Co	nmell & -B. B. oiler.	Bowlin	g Iron.
Conditions of the Metal.	Tensile strain per Equare inch in tons.	Per cent. of elongation in 8 in.	renaile strain per square inch in tons.	Per cent of elon- gation in 8 in.	Tensile strain per square inch in tons.	Per cent. of elon- gation in 8 in.	Tensile strain per square inch in tons.	Fer cent, of clon- gation in 8 in.
Normal condition. Sample heated 3 times. ** times. ** retimes. ** do times. ** do times. ** botimes. Sample placed in the flue of a stationary boiler 16 days. Sample placed in smoke-box of a locomotive 16 days. Sample placed in smoke-box of a locomotive 16 days.	31.115 30 c8 30.58 30.58 30.75 30.75 31.44 30.77	24.6 26.56 25.97 25.38 24.99 25.97 26.75 26.53	31.26 33.15 33.70 33.10 32.43 32.80 32.63 28.64	29.14 91.48 92.06 92.06 92.45 92.45 93.25 90.11	22.66 21.51 20.15 20.75 20.83 21.68	7.43 7.23 9.17 7.81 8.28 8.60 7.22 8.17	21.08 20.28 20.36 20.64 20.02 20.70 20.35 20.30	13.67 14.64 15.71 17.96 16.79 18.54 16.40 14.65
16 days.	26.10	28.51	28.25	24.61	15.27	5.85	25.24	11.32

liery locomotive. As the engine was subject an extent that they soon broke. It to considerable variations of work, and was derstood, however, that Professor extent of 1/4 inch.

The results of the tests showed that Interesting Archaeological Discoveries. Siemens steel retains all its good qualities, except after the very severe treatment of being subjected to long and continued red heat; that Bessemer steel suffers no deterioration except a slight falling off in its flexibility, and that even after being heated and cooled to times it has only slightly increased in tensile strength, while it has meintained.

Port of New York.—Supervising Inspector
General Dumont has received the April report from the special inspectors of foreign
passenger steam vessels for the port of
New York. The report shows that 87 steamers were visited, 10 only of which were granted certificates of inspection. Of those of the Treasury, with the understanding that all deficiencies would be made good before appears crystalline under the microscope and brittle under the hammer. It was found

eighth line were obtained were placed in the | were observed to pass constantly from the flue of a stationary boiler for 16 days, care atmosphere down to the earth, and at the being taken to keep them clear of ashes, so same time a yellowish white light more or that they received the heat from the boiler less steady rose above the rods, showing in on their under sides, while their upper sur-faces were exposed to the heat radiating aurora borealis. In one instance a ray some through the fire-bars from the fire. Mr. Barnaby considers that the heat of these from the rods on the one hill, and there was samples was often up to 800°, and at other imes very much below that point. The determinations shown in the ninth line were obtained from samples suspended for 16 days from a bar fitted in the smoke-box of a colidle at night, the samples would be alter-nately heated and cooled. Experiments with necessary material and apparatus and then to various alloys showed the maximum temperature to be about 800° F. The last line gives the results of tests made on samples lance. It will be readily understood that which had been placed under the bridge of an annealing furnace in such a position that an enormous lightning conductor, or a system the flames could not impinge upon them. of conductors all joined to the same earth plate. Already one fact of scientific importance being allowed to cool down each evening, and being got up to the required heat again next morning, so that the samples were exposed to a black heat at night and during the daytime to a red heat, simply seen playing about the termingle of simply seen playing about the same earth plate. Already one fact of scientific importance and simply simply seen playing conditions the same earth plate. Already one fact of scientific importance and simply simply simply simply simply seen playing conditions that the same earth plate. Already one fact of scientific importance and specific importance and simply sufficient in the 16 days to scale them to the | sionally seen playing about the terminals of elevated objects.

Some extensive researches were recently bilty, and that even after being heated and cooled for times it has only slightly increased in tensile strength, while it has maintained its percentage of elongation, and that after the samples had been subjected to the conits percentage of elongation, and that after the samples had been subjected to the continued red heat the results obtained were most satisfactory, and greatly superior to those of iron; that the irons only deteriorated under a continuous red heat, under a continuous red heat, under the clay, there were found a rudely-chipped stone hoe, a rude stone ax with a groove, a split pebble, a tragment of a stone gorget, worked antier tips, and several rude arrow to the continuous red heat. than the steel.

After the samples had been broken in the testing machine they were bent by a hamer over a bending block as far as they could go, and illustrations are appended to could go, and illustrations are appended to the report showing how far the process was carried before cracks were developed. As might be expected, the results were very might be expected, the results were very uncertain, but, on the whole, the Siemens ashpits, suggest the possibility that on special steel came the best through the trial, after occasions an the articles in the house, with steel came the best through the trial, after bending into horseshoe shape without the development of a flaw. The preliminary stretching appeared to have completely destroyed the flexibility of the iron, which cracked upon the slightest curvature.

Inspection of Foreign Vessels at the Inspection of Foreign Vessels at the ort of New York.—Supervising Inspector character of the contents of the pits, and

pounds by Pressure.

Mr. Spring, the German chemist whose not receiving certificates, some were steam-ers clearing without passengers, therefore pressure were recorded in our columns some not requiring inspection. Those clearing time since, has continued his restarches and with passengers, but without certificates, now gives some of the results obtained. He were found deficient in some of the minor found that when zinc filings and pulverized details of the requirements of the law, but arsenic in proper proportions are submitted were cleared by permission of the Secretary to a pressure of 0500 atmospheres, a homo

H. D. SMITH & CO.,

Plantsville, Conn.,

Manufacturers of the

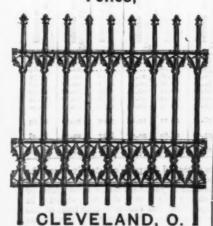
BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forge Carriage Irons, of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

PRICE LIST. SEND FOR





The best and cheapest Fence manufactured. Over 1,000,000 feet now in use Send for catalogue and estimates.



CURTIS PRESSURE REGULATOR.

STEAM and WATER, a made entirely of metal; occupies the same space as a globe valve. It has no islands or packing, and is a ock-up valve. Write for ircular. Manufactured by Curtis Regulator Co.,

C1 Beverly St., Boston, Mass

COBB& DREW Plymouth, Mass.,

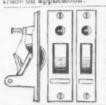
Manufacturers of Copper, Brass and aron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trenk, Clout and Cigar Box Nails, &c. Rivets made to NEW YORK AGENCY.

GRUNDY & DISOSWAY,

HARDWARE, 165 GREENWICH STREET, Agents for the Philadelphia Star Carriage and Tire Bolts



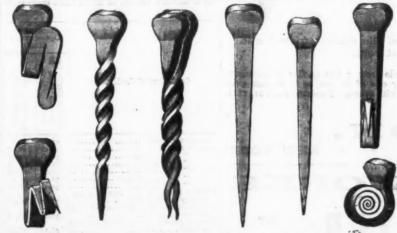
MER & CO., Manufacturers of Patent Jail Padlocks, Brass and Iron Padlocks, Carriage Lamps and Lanterns, 28 to 42 Summer Avenue Newark, N. J. Illustrated catalogues sent to the trade on application.



HUGUNIN SASH BALANCES Robt. B. Hagunia. Hartford, Conn., U. S.

Superior to any other Light for Mining

Purposes. Manufactured by JAMES BOYD'S SON,



PLATTSBURGH, N. Y.

A. WILLIAMS, Pres't and Treas. S. F. VILAS, Vice-Prest. W. S. GUIBORD, Sec'y. AGENTS:

ELY & WILLIAMS, Philadelphia and New York. S. H. & E. Y. MOORE, . . Chicago. SLIGO IRON STORE CO., St. Louis. S. G. B. COOK & CO., Baltimore.

Correspondence Invited

The Farrel Foundry and Machine Co.



ANSONIA, CONN., ROCK & ORE BREAKERS,

COPELAND & BACON, General Agents S5 Liberty St., New York,

SHULTZ BELTING COMP'Y,

SHULTZ PATENT FULLED LEATHER BELTING AND LACE LEATHER

Our BELTING is made of Leather, tanned on the surfaces only; the interior (which is the fiber and strength of the hide is not tanned, but Rawhide fulled and softened by our patented process. Our Belting is more pliable, and hugs the pulley better, and transmits more power than any other belt.

Our Rawhide Lace Leather and Belt Gresse are the best in use.

VALVES FOR FURNACES AND IRON WORKS.

We make out of our Patent Leather, Valves for furnaces, which we claim last five times as long say other. We will furnish for trial \$\frac{1}{2}\$ worth, without charge, to each of the first ten parties send hish for trial \$5 worth, without charge, to each or and a seful little book on Belting free, on applicati Agents in all Important Cities.

THE CILBERT & BENNETT MFC. CO.



Georgetown, Conn., Manufacturers of Iron Wire, Sieves and Wire Cloth,

Power Leam Painted Screen Wire Cloth GILDERT'S RIVAL ASE SIEVE Galvanized Twist Wire Netting-49 Cliff Street, New York.

CLEVELAND FLUE CLEANER MANUFACTURING CO.,

and economical



It saves from 15 to 25 per cent in labor and fuel.

Nos. 10 & 12 Franklin St., New York, Send for Cucular and Price List of Cleaner and Hose. 22 & 24 POWER BLOCK, CLEVELAND, O.



MAST, FOOS & CO., Springfield, Ohio.

For Cutting Round and Flat Bar Iron and Sheet Metal. MADE ENTIRELY OF CAST STEEL.

Cheapest and best tool for the purpose ever put on the market. Send for Descriptive Circular.

811 Market St., Philadelphia, Pa.



ELY & WILLIAMS, 178% Water Street, New York. RUNYON & HALLETT, 103 Chambers St., New York.

FOUNDRY, BIRMINGHAM IRON

BIRMINGHAM, CONN.

CHILLED AND SAND ROLLS, ROLLING MILL MACHINERY of all kinds,

Shears, Squeezers, Wire Benches, Presses, &c., IRON CRANES and RUBBER MACHINERY,

IRON AND BRASS CASTINGS. FOUNDRY FACINGS, PLUMBAGO & FOUNDRY SUPPLIES.

S. OBERMAYER & CO., Manufacturers of and dealers in all kinds of

FOUNDRY FACINGS AND BLACKINGS. PLUMBAGO AND FOUNDRY SUPPLIES.

Capacity of Works, 650 Barrels per day. HEAVY MACHINERY and FINE STOVE PLATE FACINGS A SPECIALTY. for Catalogue and Price Elet.

CINCINNATI, ONIO, U. S. A. Office and Works.





CHAIN PUMP TUBE

Special prices to the wholesate trade for the next 30 days.

122 Railroad Avenue, ELMIRA, N. Y.

R. COOK & SONS.

Manufacturers of

Carriage & Wagon AXLES,

WINSTED, CONN. ENTABLISHED - - - - 1839.

N. Y. MALLET and HANDLE WORKS

Caikers', Carpenters', Stone Cutters', Tin, Copper and Boiler Makers' MALLETS,

Hawsing Beetles, Hawsing and Calking Irons also all kinds of Handles, Sledge, Chisel and Ham mer Handles, Also

COTTON AND BALE HOOKS. Patented Feb. 13, 1877; a new combination of Hooks 456 B. Houston St. New York City.



WHIPPLE MFG. CO., CLEVELAND, O.

Builders' Hardware, DOOR LOCKS & KNOBS

Fine Bronze Trim mings.



Keystone Screw Co., 17th and Venango Sts., PHILADELPHIA.

J. BILLERBECK,

Manufacturer of Iron Gimlet-Pointed Wood Screws.

Vulcanized Rubber Fabrics

MECHANICAL PURPOSES.

RUBBER BELTING and PACKING.

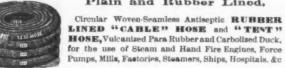
Machine Belting. Leading Hose, Grain Elevators. Steam Hose, Piston Rod Packing,



Vacuum Pump Valves, Ball Valves, Car Springs, Wagon Springs, Gas Tubing, Machine Belting. Billiard Cushions,

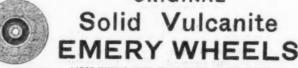
LINEN and COTTON HOSE.

Plain and Rubber Lined.

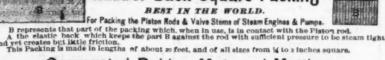


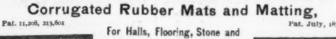


Emery Wheels and Packing.



PATENT ELASTIC **Rubber Back Square Packing**







Iron Stairways, &c. This practical and maispensable article—especially for wear where exposed to ice, anow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manusacture, while the cheap, public by reckless imitators of our patent goods soon becomes brittle



nferior quality forced on the pu

NEW YORK BELTING & PACKING CO.,

JOHN H. CHEEVER, Treasurer.

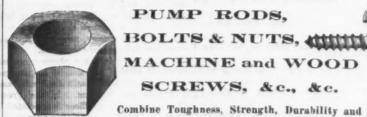


BUCK BROTHERS, Millbury, Mass. The most complete assortment in the U.S. of Shank, Socket Firmer and Socket Framing Chisels

PLANE IRONS.

PHOSPHOR-BRONZE

BEARINGS, SLIDE VALVES, CYLINDER RINGS.



PUMP RODS. BOLTS & NUTS, MININ MACHINE and WOOD SCREWS, &c., &c.

Resistance to Corresion,



" Phosphor Bronze." CASTINGS OF ALL KINDS TO ORDER.

SEND FOR PAMPHLET AND PRICES.

THE PHOSPHOR BRONZE SMELTING CO., LIMITED. No. 512 Arch St., PHILADELPHIA, PA.

Owners of the U. S. Phosphor-Bronse Patents. Sole Manufacturers of Phosphor Bronse in the United States,

dissolve completely in sulphuric acid, evolvof a metallic luster, hard and brittle and which does not clog a file. Arsenide of tin obtained in this manner is a white metallic and brittle mass, with foliated structure, fusible at a higher temperature than tin and dissolving with some difficulty in hydrochloric acid. The arsenide of cadmium was submit ted to pressure three times and gave a brittle metallic mass. Copper was found to combine with arsenic under pressure only with difficulty, and after having been submitted to the operation some eight times a homogenous metallic mass was obtained, brittle and granular and grayish-white in color. Silver was found to give a similar mass, being of a bluish-gray color and homogeneous in structure. Arsenic itself, when submitted to 6500 atmospheres, acquired a metallic luster and a specific gravity of 4.91. Balsing of the Steamship Austral.

There are probably not a few of our readwho will recall the sinking of the steamship Austral, in Sydney Harbor, Australia, last year. The facts of the case, as reported at the time, were that the vessel was lying without cargo on board, and that the water ballast provided for steadying her under such circumstances had been removed from the double bottom of the vessel, and that she was being supplied with coal. The ports were open, and as the coal was placed too on one side of the vessel, some of her port sills were brought under the surface Before the state of affairs was noticed, a large quantity of water had entered the bunkers and the vessel went down in about a quarter of an hour from the time the alarm was given. The managers of the Orient Co., to whose line the Austral belongs, took the necessary steps to raise the vessel. latter was lying on her bilge, the greatest depth being about 51 feet aft. It was at first proposed to close the openings, and to sur-round such openings as the engine and boiler hatches and the cabins, saloons, chart houses. &c., by coffer-dams having water-tight con-nection with the decks, and after providing air pipes to every water-tight chamber, to pump the water out of the vessel. Owing, however, to the want of a sufficient number of skilled divers, this arrangament was modi fied, the following course being adopted: The sides of the vessel were continued above the water level by means of a coffer-dam 410 feet long and having a depth of 27 feet. This was provided with one water-tight transverse bulkhead amidships, thus dividing the entire structure into two water-tight compartments, facilitating control during the operation of raising. The coffer-dam was operation of raising. The coffer-dam was formed of vertical timber frames placed at short intervals apart, and each pair of frames was supported by a transverse strut, the weight of which was taken by two small vertical struts secured longitudinally wallings. The outer skin of the coffer-dam was formed by longitudinal planks about 4 nches in thickness, and was made water tight by a covering of sheets of canvas tacked on to the planking and extending some distance below the lower edge, so that the pressure of the water could accommodate it to the hull of the vessel. This made an effectual water-tight joint. The framing of the coffer-dam was secured to the hull by means of bolts passed through the scuttle lights and through oak toggles on the inside, and similarly to other toggles or stringers passing behind the stanchions of the promenade deck. The whole of this work was prepared on shore to the required dimensions, ready for bolting and spiking in position. The skin planking was pre pared in sections consisting of four or five planks 16 feet long, which were weighted and lowered in position by small vessels alongside of the one to be raised. A number of centrifugal pumps were fixed over the forehold and also over the afterhold in the ordinary manner, and as the pumping proceeded the vessel rose nearly upright.

The Ironworkers at Dowlais.

Mr. Robert P. Porter, writing from Merthyr Tydvil, Wales, says: I walked from Merthyr Tydvil to Dowlais

where are probably the largest iron works in the world, employing, it is said, 9000 hands— 1000 under and 5000 above ground. In the journey one passes houses black, white and gray, yellow and mouse-colored, piebald and CROSS-HEAD GIBBS, STEPS, BUSHINGS,

And all purposes where Maximum Durability, Anti-Frictional tent bowlders, "a few bony cabbage-scalks were shamming to grow." Muddy streamlets were shamming to grow." Muddy streamlets the Denver National Mining and Industrial Exposition has were cascading from the hillside. Rails and were cascading from the hillside. Rails and dingy railway bridges and flat-topped sloping are sunken lower than the streets, and others are entered by steps. The doors were mostly thrown wide open, and, as I toiled up the hill, I had excellent opportunity for observing how men with large families exist on 2/6, or 60 cents, a day. Without any exaggeration they are little better than pig-styes—broken down, leaky, grimy hovels, with everything crowded into one general room. I doubt if in that walk of two miles I found one comin that walk of two miles I found one com-fortable home, one sheerful, tidy cottage. They were universally dilapidated, universally gloomy, with no outlook in front better than pools of black, slimy mud, and no present pect at the back but yawning chasms and dismal mountains of slag.

dismal mountains of slag.

As for Dowlais, I can only say that it has been truthfully described as "a dirty, slovenly, big village," in which "the clartier the cosier" seems to be the moto. The following is an accurate description of the utter bewilderment of a stranger first turned adrift in the Dowlais Works: "He hears a sighing roar like that of ocean, a hiss of steam, a clank of iron, a whirr of wheels; sulphurous smoke and a spray of grit ohoke his nostrils; he sees round keeps and angular bastions, with fire leaping from their summit and glowing at their base; a forest of chimney stacks—a jumble of mysterious buildings of all shapes and sises, a mase of

muddy rails, mounds of coal and lime, piles ing hydrogen arsenide and leaving only a small black residue. A similar mixture of lead and arsenic gave a homogeneous block of a metallic luster, hard and brittle and which does not clog a file. Arsenide of tin ground is black as ink and sticky as tar, and men and girls are shoveling it up by truck loads. Wherever the dazed visitor seeks rest for the sole of his foot a tram-horse trots right at him. It is, indeed, a bewildering nightmare vision—that 'lurid Valley of the Shadow of Tips.'" Some of the girls one sees in this part of

South Wales are very dirty, very bold-eyed, and yet squalidly picturesque, with their cheap earrings and their colored kerchiefs. They ply their shovels like navvies, and lift immense blocks of stone and coal. ployment of women in this labor, thanks to the Factory act, is growing less in England, and in 1880 not over 5000 were so employed. Dr. Rowe, in his little work on the laboring classes of England, says that an enormous quantity of drink is consumed in Merthyr. on?" "Beer," is When maddened What do the miners live on ?" the first answer you get. When maddened with drink the miners fight long and furiously. They turn out into the street, strip to the waist, and, not content with blinding one another with their sledge-hammer blows they fasten their teeth in one another' ears and shoulders, and worry the flesh like

Some of the miners attend chapel on Sun Some of the miners attend chapel on Sun day, but the English Established Charles, judging from the following description of the parish church of this town, has no hold ou the Welsh miners: "It has a dimly illu-minated clock, but that is the only thing bright about it. It seems to be moldering away in its green church-yard, as the Bibles painted on some of the tombstones are scaling off from the green slabs. The flags are as damp as the bricks of a cellar. When the clergyman goes to the communion table, he is quite exiled from his sparse congregation, There were between 40 and 50 persons present on the morning I attended. The faded organ seemed to be shivering up in the chilly gallery; and when the thin old clerk in wig and spectacles and long-skirted coat took round the pewter plate, he looked like the last of his race. It was worth while going to church, however, if only to hear the Litany read in Welsh. It was a sea-like

piece of music. Returning down the hill to Merthyr Tyd-vil, I passed the old Pen y Darran Iron Works, now closed and rapidly going into decay. The gate was opened and I entered. Within the gray, moss-grown walls it looked like a dead city. Twenty years ago 3000 busy men circled round these rained workshops. All was then as smoky, as black, as active and as bewildering as Dowlais is now. I wandered amid the gray-stone blast fur-naces, now covered with grass and weeds, and through the vast sheds in which lay the pondereus machinery, thick with rust. Shafting wheels, engines, steam-hammers, anvils, forges, puddling furnaces, rolling machines, with rust accumulated, had remained silent and stationary for 20 years. The solitude of the place was only broken by the rushing of a stream cascading down the hill, and by the singing of the birds. In the blast furnaces and ovens through which once roared the flames from melting iron, and in the once smoke-enveloped rafters, the birds build their nests. Here, too, the ivy clings and the wild flowers grow. The iron-work which once incased the boiler has crumbled away, and the rusty iron shells look like a row of dead giants bursting from their stone coffins. Moss-grown was the mortar, and green vegetation was peeping forth inside where 20 years ago hissel the steam that propelled the now motionless ma-chinery. The outfence had collapsed and become gray with moss and lichen; the shops had decayed by degrees; abandonment and desolation had crept downward toward the valley, and nature was slowly asserting her-self again. The bell that formerly called the men to work and the clock remain silent in the cupola, and the weather indicator on the top had lost all its letters but the W. Sitting in the midst of this huge industrial graveyard, the thought occurred that pos sibly the significance of this was the fact that the iron industry had taken deep root in the far West, or that, perhaps, better paid, better fed, better housed men, with brighter futures and larger possibilities were doing at this moment the very work that this mill, with its cheap labor, located in the center of the second great coal dis-trict of England, within a few miles of

National Mining and Industrial Exposition has just been issued. It contains much of interpiles of black rubbish ran and rose on all sides. The houses on both sides of the narrow, dirty, winding, steep road leading to Dowlais are occupied by the miners and laborers. They are about on par with those at Contraction of the contracti Coatbridge, Scotland. The floors of some Exposition to afford visitors all information necessary on these subjects. The Exposition necessary on these subjects. The Exposition will open July 17 and close September 30.

Mr. Clinton Rice, of El Paso, Tex., has been appointed general agent of the Exposition

> A piece of mosaic work, measuring about 140 feet, and so well preserved that the designs are easily traceable, is reported to have been recently discovered on the bench of the Gulf of Carthage. It bears three inof the Gult of Cartange. It bears three in-scriptions in Roman capitals, and on each side a seven-branched candlestick. The de-signs include figures of birds, lions and fishes, ornamental scrolls, &c. The general sense of the inscriptions appears to chronicle the

The Iron Age

Metallurgical Review.

. New York, Thursday, May 10, 1883.

DAVID WILLIAMS Publisher and Proprietor JAMES C. BAYLES Editor. Business Manager JOHN 8. KING

RATES OF SUBSCRIPTION,

INCLUDING POSTAGE.

THE UNITED STATES, BRITISH AMERICA AND SANDWICH ISLANDS.

TO ALL OTHER COUNTRIES,

PER ANNUM, POSTPAID.

Weekly Edition: \$5,00-\$2;-25 francs-20 Marks-12 forms-6 roubles (coin)-25 lire-20 posetos. Bemt-Monthly Edition: \$2.50-10/-12% francs-10 marks-6 fiorins-3 roubles (coin)-12% lire-10 pe-

Monthly Edition: \$1.25-5/-61/ francs-5 marks-1 forths-1/2 roubles (coin)-61/ lire-5 pesetos.

florins-1/2 roubles (coin)-6/4 lire-5 pessios.

REMITTANCES

should be made by draft, nevable to the order of David

Williams, on any banking house in the United States
or Europe; or, when a draft cannot be obtained, in

postage stamps of any country.

NEWSIEALERS OR BOOKSELLERS In any part of the world may obtain *The Iron Am* through the American News Company, New York, U. S. A. the International News Company New York, U. S. A., and London, England; or the San Francisco News Co. San Francisco, California, U. S. A.

RATES OF ADVERTISING. One square (12 lines one inch), one insertion, \$2.50; one month. \$7.50; three months, \$15.00; six months, \$25.00; one year, \$10.00; payable in advance.

BRITISH AGENCY.

Office of THE IRONMONGER, 448 Cannon st. London

DAVID WILLIAMS, Publisher, 83 Reade Street, New York

PHILADELPHIA...... 220 South Fourth Street
Thos. Hosson, Manager.

BOLE AMERICAN AGENCY FOR THE IRONMONGER,

Published at 44a Cannon St., London. oldest and leading representative of the British and Hardware Trades.

Hy a murual clubbing arrangement between the two ingreads, subscriptions to both will be received by either The Pronmonger or The Fron Age on the following terms:

THE IRONMONGER and THE IRON AGE, Weekly

CONTENTS.

First Page .- Chain-Saw Mortising Machine Iron Made from Magnetic Sand by the Siemens Direct Process. Prospects in the British Iron Trade. Gradiny Pig Iron by Grain. The Trade Merk Treaty With Spain. Third Page .- Modern Methods of Cutting

Metals. Fifth Page .- Modern Methods of Cutting

Metals (Continued).

Neventh Page - Modern Methods of Cutting

Metals (Concluded). The Power of Explosives English Iron and Steel Shipbuilding in 1882.

Winth Page.—English Iron and Steel Ship building in 1892 (Concluded). The Beech for Char coal Railway Bridge Accidents.

Eleventh Page.—Effect of Repeated Heating

on Steel and Iron. Inspection of Foreign Vessels at the Port of New York. Scientific and Technical Thirteenth Page, -Scientific and Technical Denver National Mining Exposition.

Fourteenth Page.—Labor Troubles in the Iron Mills of the West. The Consumption of Iron Legal Arbitration in Pennsylvania The Use of Magnetic Iron Sand in the Siemens Fifteenth Page .- The Use of Magnetic Iron

Sand in the Siemens Direct Process (Concluded). England's "Fair Trade" Bluster. The Tin-Plate The New Steel Cruisers, Trade-Marks Under the New Tariff. The Iron and Metal Exchange Reorganization.

Serenteenth Page .- The Iron and Metal Exchange Reorganization (Continued).

Nineteenth Page .- The Iron and Metal Exchange Reorganization (Concluded). British Open Hearth Steel in 1881. Charcoal Pig Iron in 1882 The Mersey Tunnel. A Novelty in Marine Architecture. The Opening of the Bridge.

Twenty-first Page.-Trade Report-British Iron and Metal Markets. Financial.

Twenty-second Page Financial (Concluded), General Hardware, Iron. Metals, Imports, Exports. Coal. Old Metals, Paper Stock, &c. Foreign Trade Movements. entwethird Page. - Philadelphia. Pitts

burgh. Chicago. Chattanooga. Cleveland. Louis ville. Biltimore Twenty-fourth Page .- Cincinnati. St. Louis

our English Letter. Foreign. New Publications. Fast Ocean Voyages

Trensylvatrik Page.—The Tin-Plate Duty.
New York's Commerce. The Economical Utilization of Ceal Trade Publications.

Treenty-eighth Page.—Trade Publications (Concluded. Marshall & Co.'s Affairs. Depression in Iron Ore Freights. Industrial Items. Barthold's Liberty.

Thirty-first Page .- The Iron Age Direc-

Thirty-fourth Page .- New York Wholesale Prices (Continued).
Thirty-sixth Page. - New York Wholesale

Fortu-first Page.—Philadelphia and Pitts-urgh Hardware and Metal Prices.

Forty-second Page,—Boston Hardware and Metal Prices.

no further arguments to use than those adout date and without any provision for a future meeting. This, of course, does not mean that future meetings cannot be held, and the relations of the parties are such that ference for any purpose such a conference would be held at any time agreed upon, but it means that at present negotiations are at ernment bonds. an end, the manufacturers insisting on their demand for a reduction of wages, and the The Consumption of Iron per Capita workingmen refusing it.

What the outcome will be is, of course, uncertain; still, guesses may be made which will indicate more or less the probabilities of the outcome, according as the person making themselves freely with the necessaries of the guess has facilities for learning the inside views of either party. It seems, however, to be a fact that the leaders on both sides have not vet fully given up hope of settling the difference without a contest, but, at the same time, both parties speak determinedly as to their intention not to yield. One good indication is that there is an entire absence of the bluster and bluff that have been manifest in previous strikes prior to the beginning of the contest. Both partes seem to realize that these contests now have come to a point where they are no child's play—that the interests involved are so great and the suffering entailed by a strike so lamentable as to call for earnest, honest work and state-

Of course, our relations are such that we are better acquainted with the manufacturers' side than with that of the workingmen, though we in no way speak for the manufacturers. There seems on their part a determination to insist on a reduction. reasons for this we have already stated in our columns and need not repeat here, except to say that in general terms they are that reductions have been made by the Amalgamated Association in the wages of the workmen engaged in industries and in sections which come squarely in competition with the iron made in the mills affected, and they believe that they are also entitled to a reduction. They also assert that the state of the trade, the condition of prices and the prospect for the future all necessitate their demand, and they purpose to insist upon it. What the views of the workingmen are we have, of course, no means of knowing, except in a general way. However, there appeared last week in two Pittsburgh papers two editorials so much alike as evidently to have been inspired by the same party, and showing internal evidence that that inspiration was the workingmen. The argument used in these editorials is that the outlook of the manufacturers for the future is by no means discouraging, but that the indications are that business will be brisk; that the reduction in the tariff outside of steel rails really was but about 5 per cent., and for the manufacturers to ask for 10 to 20 per cent. reduction is a manifest injustice, and also advancing the absurd idea that the manufacturers-meaning, of course, the iron manufacturers-insisted upon the passage of he new tariff, while the operatives opposed its passage. A more false and absurd statedents, and Mr. Weeks, the secretary of one of the Western iron and nail associations. used their utmost endeavors to prevent its passage, and they certainly can be regarded as representing in their official capacity the wishes of the iron manufacturers. Assuming these to be the views of the workingmen and they coincide with statements which the papers report them to have made at the conference of last Thursday-it is evident

That there is a depression in business no ne who has the least knowledge of business doubts. Not only has there been a decided reduction in prices, as can be seen by anybody from the quotations made from week to week in our market reports, but there has also been a falling off in demand, and while it may be true that the consumption of iron will be very nearly up to that in, say, 1878 or 1870, it is also true that the capacity of the country for manufacture has been so largely ncreased in that time that the mills will be abundantly able to meet it without running anything like full time, and this means stoppage of some works or cutting of prices to get orders, and this will go on until the point s reached below which it is impossible to go. When capital is exhausted, bankruptcy will Thirty Afth Page .- New York Wholesale follow, and this seems about the course of the iron trade to-day.

that they are building on false hopes.

The Savings Bank Law of the State of New York has been so far modified by the past, were to be considered apart from the these courts.

Labor Troubles in the Iron Mills of character to invest in railway mortgages under certain restrictions, thus increasing the line of their investments. The change As was announced in our issue of last in the statute is also intended to secure for week, a meeting of the conference commit- depositors a more remunerative interest upon tees representing the Manufacturers' Asso- their savings. Another effect may be an ciation and the Amalgamated Association absorption of railway mortgages by displacwas held on Thursday, the 3d inst. From ing to a certain extent Government bonds. reports received it appears that the joint The question which above all others concerns committees were in session only about 15 the industrial classes is not so much the rate minutes. Mr. Jarrett, on behalf of the of interest which it may be possible to realize, Amalgamated Association, stated that he as the absolute security of the principal on was authorized to refuse to accede to the de- deposit. Whatever may be the restrictions mands of the manufacturers for a reduction imposed by what is known as "the Page in wages, on the ground that they could not | bill"-now awaiting the signature of Govsee the necessity for it. The manufacturers ernor Cleveland-the guards heretofore are understood to have stated that they had existing and now partially removed are sure to be broken through by unscrupulous bank vanced at the previous conference, and one managers in the absence of stringent offiof them moved an adjournment, which was cial supervision by the highest authority. carried, and the conference adjourned with- From the nature of the case, the State officers will be charged with a higher responsibility, which they must not scruple to assume and unswervingly discharge. The magnitude of the interests affected appears from the fact no doubt if either side were to ask for a con- that January 1st, 1883, the savings banks of this State had on deposit no less than \$412,000,000, including \$140,000,000 in Gov-

There is no doubt that the most civilized nations use the highest quantity per capita of any product. They are able to supply life, to furnish themselves elaborately with the conveniences and to lavish upon themselves abundantly the luxuries of existence. Civilized nations not only surround themselves with plenty of food and procure it in great variety, but they clothe themselves well, they furnish their houses with completeness, they use machinery in their varied occupations, they bridge streams, they provide for themselves the most com fortable and speedy means of transportation. and in every way they add ease, comfort, convenience, and even pleasure, to the performance of the ordinary duties of life. is therefore quite common among political economists to measure the advancement of a nation toward the plane of high civilization by its consumption of such products as indicate the perfect development of mechanical skill or the widespread existence of diversified industry. Wool, sulphur, iron and other useful products are each referred to as furnishing tests for comparing the relative advancement in the arts and sci-

ences of different peoples. To those who are interested in such investigations and comparisons, a table of some value will be found in Mr. J. S. Jeans's recent report to the British Iron Trade Amociation, of which he is secretary. Mr. Jeans has made a careful calculation of the annual consumption of iron per capita of almost every country in the world, according to the latest advices. We presume, however, that in this case the rule laid down by political economists will have to be varied from a little, if it can be made sufficiently flexible, for surely the Falkland Islands cannot be the center of the civilization of the globe; yet competitors, being 367 pounds. New South Wales, too, can hardly be regarded as in the foremost rank of enlightenment, but it comes next, with 362 pounds. These antipodal regions seem to be immense consumers of iron according to their population, for South Australia comes next, with 311 pounds. Great Britain is relogated to the fourth place in this list of iron absorbers, consuming but 287 1/2 pounds. Nevertheless, she triumphs over her lusty child, the United pounds. But along come two more of Great Britain's children-Queensland, with 269 with 187 pounds. though so wonderfully clever, far down in the Anglo-Chinese settlement of Hong Kong, with 133 pounds, and Uruguay, with 130 other process to enforce the same. pounds, preceding (can it be possible?) Germany, with only 1231/3 pounds. Surely this there is something wrong with the figures. But what comes next after Germany ! The country reaches a consumption of 100 pounds. Sweden comes not far from it : then comes Tasmania, Newfoundland, the Cape of Good Hope, the East Indian Straits settlements, Natal, the Argentine Republic, Malta, Denmark, Austria and Norway. No other country, not even Spain, Portugal, Russia or

Italy, reaches a consumption of 35 pounds. We have a suspicion that the large per named countries was an accidental coin-Legislature as to permit institutions of this United States, and put in such a list for com- | Judging, however, by the experience of The Siemens process has unquestionably

parison, we have no doubt that their per legal arbitration, or arbitration with legal year or two later, however, their consump-Falkland Islands in the foregoing comparison is out of all proportion to their population or was 1543, and the iron used in that year was but 253 tons. The Fiji Islands do not rank much higher in these particulars, for their population was only 13,198, and the iron onsumed was only 716 tons.

Our treatment of this subject will not be complete without showing the actual quantity of iron consumed by the principal countries of the world in the year taken for comparison by Mr. Jeans. In the appended table the countries are named in the order of their consumption of iron, the United States heading the list, Great Britain making a good second, France coming third, with Germany close to her, and the others following far behind:

Countries.	Tons.
United States	6,065,010
Great Britain	4.618.933
France	2,508,706
Germany	2,488,957
Russia	965,000
Austria	625,000
Belgium	587,000
Italy	280,000
Holland	257,903
British India	240,750
Canada	236,272
Spain	203,494
Sweden	190,000
New South Wales	131,128
Victoria	77.983
Brazil	73,750
Turkey	6<,000
Portugal	58,600
Argentine Republic	54.400
Mexico	48,821

The consumption of other countries is too insignificant to quote. There seems to be little reason to doubt that this table shows better than the per capita calculation the relative importance, if not the exact degree of civilization, of the countries named. As Americans, we have no fault whatever to find with it.

Legal Arbitration in Pennsylvania.

The bill providing for legal arbitration in the State of Pennsylvania, commonly known as the Voluntary Trade Tribunal act of 1883. has become a law by the signature of the Governor. This bill provides in effect that upon the joint petition or agreement of a certain number of workmen and a certain number of separate firms, individuals or operators within the county, who are emloyers of labor, the petitioners to have certain qualifications which are set forth in the act, a license for a trade tribunal may be issued by a judge of the Court of Common Pleas, which tribunal shall have the settlement of such labor disputes in the iron, glass, steel, textile and coal industries as may be submitted to it. The petition for the formation of this tribunal must set forth, among other things, the number and names of the members of the tribunal, an equal number representing each side, and also the name their per capita consumption surpassed all of an umpire. The board first attempts to come to agreement without the services of the umpire, these being called in only after disagreement of the tribunal or failure during three meetings held and full discussion had. The award of the arbitrator or umpire is final and conclusive upon such matters only as are submitted to him in writing, signed by all the members of the tribunal, or by the parties submitting the same; but upon questions affecting the price of labor the decision is in no case binding upon States, which appears as using only 271 either party, except as they may acquiesce or agree therein after such award. The members of the tribunal receive no compensation pounds, and West Australia, with 262 pounds. for their services, their expenses, however, It is indeed remarkable that all the countries being paid. When the umpire makes an It will be seen from the above condensed

cannot be a good test of civilization, or else very much after the Conseils des Prudhommes since 1878, when first introduced into the of France and Belgium. In the French conseils the presiding officer is appointed by Fiji Islands, with 1211/2 pounds. Then our the State, and the tribunals are organized at both Messrs. Park and Dr. Siemens made neighbor, Canada, follows these islands of the request of the chambers of commerce. the mistake of endeavoring to apply the the South Sea, with 120 % pounds. No other In Pennsylvania tribunals are organized at the request of the employers and employed, who also name the umpire. Another difference is that either party can hail the other before the tribunal in France and compel a settlement there. With these exceptions the Holley, that the process might be made of tribunals are precisely similar. Either can take cognizance of any question submitted to it. In neither can questions relating to results obtained at Tyrone were deemed suffuture rates of wages be considered without capita consumption of some of the above- the consent of the parties, but the French conseil has the advantage in this case over cidence, resulting from an exceptional im- the American, for in the French, when the during the year 1881. The results obtained portation of iron in the year selected for parties have once agreed to submit the questhere in the last month of that year-just comparison by Mr. Jeans. Surely, in no tion of the future rates of wages to the previous to the suspension of that companyother way could the Fiji Islands surpass decision of the conseil, then the decision is Canada, Sweden, Denmark and Austria. If, binding on both. Decisions given by the direct process beyond the stage of experifor example, some of our own Western umpire can be made matters of record in the ment. Nevertheless, the very decided skep-States and Territories, in which railroad courts, judgment entered and the judgment ticism with which many of our best steel building has been very active for a few years enforced the same as any other judgment of makers look upon this and all other direct

capita consumption of iron for 1880, 1881 or sanction, in England, we have no expecta-1882, based on their large railroad mileage tion that any good will come from the Pennand their slender population, would make sylvania act. Much as we desire to see them rank among the highest. Taken a arbitration take a firm footing in this country, we believe that at the very outset tion of iron would probably not be of suffi- difficulty will be met. It will be well-nigh cient importance to give them any rank of impossible to get 25 or more men to agree consequence. The prominence given to the upon the members of the tribunal and to signify that agreement in writing. Prior to the organization of a tribunal the worktheir gross consumption of iron, for the total men may agree upon their representatives population in the year taken by Mr. Jeans and the employers upon theirs, but to agree in each case upon men that shall be satisfactory to the other side, and when this is done, for both sides to agree mutually upon an umpire, will be exceedingly difficult. If these twenty-five men were to delegate their power to do this to five others, the five might agree, but with the diversity of views of 25 men an agreement on this point would be very difficult. It is our belief also that neither side will consent to an arbitration that has any legal sanctions to it, even if an attempt to enforce the awards of the umpire could succeed. The great cause of strikes is future rates of wages. We presume that from 50 to 80 per cent. of all important strikes in this country come either from a demand for an advance or from resisting a reduction, and it is just these questions that the tribunal cannot consider without the consent of the parties, and when they do consider them there is no obligation on the part of either side to accept the award; the election whether to accept it is after the award is made. In England, when arbitration has been in any measure a success, the men and employees have been in honor bound to accept the award when made, and in many cases it has only been this pledge of honor that has led to its acceptance. There is another feature in arbitration that this act does not seem to provide for. The great benefit of boards of arbitration in England has been that they have enabled representatives of both sides to come together, to learn the wants of both sides and discuss the condition of the market as equals, and to get that view of the feelings of each other and the needs of the trade that have been so potent in preventing strikes. At the same time, these constant meetings have inspired mutual respect and confidence, and made it more difficult for demagogues and agitators to create differences and ill-feeling that lead to strikes and lockouts. The Wallace act fails to provide for such meetings.

For these reasons, and others that need not now be advanced, we believe that this act will have but very little effect in the settlement of labor disputes. Until the time comes that both parties are content to submit their difficulties to the arbitrament of tribunals that shall be voluntarily chosen, the awards of which shall be voluntarily enforced, this enforcement being aided by strong conservative organization of each party, we have no hope to see arbitration successful in this country. At the same time, we believe that it must be employed in the future in the set-

tlement of labor disputes.

The Use of Magnetic Iron Sand in the Siemens Direct Process.

We publish elsewhere an article on this subject, contributed by Mr. W. J. Menzies, of England, now in this country on professional business, and who visited the Landore Siemens Steel Works, at Swansea, as recently as last month.

There is no question about the fact that magnetic iron-sand can be used very advantageously in the Siemens direct process. Being obtained in a fine state of division, the material is in the most desirable form for charging into the rotator, and being quite free from refractory constituents, is readily reduced. The use of this sand presents, therefore, the twofold advantage of savso far named are English, or of English award, that award may be submitted to the ing in coal and in the labor and machinment than which never was uttered, for the iron manufacturers, through Mr. Swank, the scene, with 238 pounds. But back the ban-tribunal was instituted, and if he approves they can be charged into the rotator. The secretary of the American Iron and Steel ner goes to two more English colonies.—Vic. the finding he indorses the approval thereon, analysis of one of the balls made at Swanses Association, Mr. Park, one of its vice-presi- toria, with 2021/2 pounds, and New Zealand, and the same is entered on the records of his and hammered into a billet, which Mr. Men-And now comes France, court, and when so entered it is final and zies gives in his article, shows very well inconclusive, and the proper court may, on deed; but then it must not be forgotten the list, with 149 pounds. Thrifty Holland motion of any one interested, enter judg- that experience has demonstrated the fact ranks next, with 139 pounds. Then follows ment thereon, and when the award is for a that in all direct processes the chemical respecific sum of money, may issue final and sults have always been good, and the commercial results mostly bad.

The Siemens direct process has received statement of this act that it is patterned very thorough trial in this country ever works of Messrs. Park, Bro. & Co, of Pitteburgh, Pa, where it failed, simply because process to the manufacture of bar iron from the hammered bloom. R. J. Anderson's experiments at Tyrone, Pa., were followed by better results, and fully bore out the views expressed years ago by the late Mr. value as an adjunct to the open-hearth process, and that that was its only value. The ficiently satisfactory to warrant the erection of a four-rotator plant by the Siemens-Anderson Steel Co. at their works in Pittsburgh may be said to have fairly put the Siemens

processes is by no means unfounded.

trac eve argu cally retal hear coun tion tion o all it bread pende tion o

an sir co tio to

the roy mo pol of

the mon

to m not a at all far as cerne Tory | simply tion of notwit contra trade'

experie

item of saving in coal. Dr. Siemens expected to produce one ton of blooms with obtained at Landore from August to October, son works the coal consumption averaged rect process as an adjunct, with two tons of oal-this is no better than can be accomplished and is being done in well-managed is very great, and the item of wear and tear can only be established by long and continuous hard runs, as this alone will fix the proper charge for amortization-this, together with what further savings may be effected through the enlarged experience of the men gained by such runs, will ultimately determine the commercial value of the process in this country. Thus far its more general adoption is as yet too much hemmed in, as it were, by the use of particular ores, the nearness of the coal to the ore, and our ruling prices for labor.

England's "Fair Trade" Bluster.

Some of the journals principally devoted to the work of the free-trade propaganda in this country are endeavoring to frighten American farmers by quoting, with comments, from the recent speeches of Lord Salisbury and Sir Stafford Northcote, favoring the imposition of a protective duty of 10 interest of British and Irish landlords. At Birmingham recently, Lord Salisbury, in reviewing the situation, said:

What is the present state of things? Free trade behind me calls no trade. In proportion as we measure our fervor for free trade, other nations seem to increase their fervor for protection. Both Germany and France are distinctly more protectionists than they were to years ago. What the effect is of the American tariff I confess I find some difficulty in understanding. Everybody is of a different opinion. I do not say what remedy is to be applied to these things, but it is evident to me that the original concession of free trade, sound though the principle was in itself, was adopted in something of a panic, and a sufficient precaution was not taken, by due treaty and agreement, first to secure that other nations should tread in the same path that we did. Well, if that is the case, I maintain that any party that has the national interest at heart, and that does not care for any formulas or any doctrines that interfere with that interest, would not object to inquire into the subject. At all events, the matter is one that requires grave and careful investiga-tion to see whether no remedy, by diplomacy or otherwise, can be applied to a state of things which is acting with fatal effect upon the com

What Sir Stafford Northcote says is to the same effect. Now, this sort of thing will answer very well for a stump speech, and simply means that the Tory leaders are tional Fair Trade League"-not with a view mething of which we have no record in rowest and most absolute selfishness is the of a 10 per cent. tax on food imports, and thereby, Parliament would not hesitate a traders of Great Britain demand, removing them with full and unconditional guarantees. every duty on British exports to this conntry, the British Government would not hesi tate a moment to betray us and tax to the limit of its ability to stand it anything exported from this country which could be made a source of revenue. But no argument is needed to show that in her present position Great Britain is practically powerless to follow the policy of retaliation against us of which we have heard so much of late. Our exports to that country are not a kind which will bear taxation there, with the single important exception of tobacco, which is already loaded with all it can carry. American cotton and breadstuffs are too necessary to a nation dependent thereon to be taxed for the protection of landlords, who are not so popular as to make the masses of the people, who do not and cannot become landed proprietors, at all auxious to favor them at the cost of a diminished food supply at higher prices. So far as the interests of this country are concerned, we can take the bluster of the fair traders and the cautious admissions of the Tory leaders for all they are worth, which is simply nothing. Great Britain is no longer in a position to dictate the ecomomic legisla tion of the world. No doubt a great many of her people cherish the notion that she can, notwithstanding the abundant proof to the contrary, but the fact is that the "fairtrade" scheme is impracticable, and those who are using it for political purposes

thus far given the best results-but these re- tage in the use of steel, especially open- education gives peculiar meaning to all the sults fall far short of the expectations from hearth steel, over iron very apparent in all words connected with power, force or work. it, and of what Dr. Siemens set out to those cases where the metal is subject to fre- Synonyms are introduced, words are coined, accomplish. This is particularly true of the quent changes in temperatures widely apart, and the confusion of terms is scarcely less It, is a matter of regret that Mr. Barnaby has adopted the rather too general classificaone and a quarter tons of coal. The results tion of the material tested into Bessemer steel, open-hearth steel and wrought iron. 1881, are given by A. L. Holley at "160 tons Considering the large latitude in quality in "9 cwt. 2 qrs. of coal for 107 tons 9 cwts. each of these products, it would certainly be 2 qrs of blooms = 1.49 tons of coal per ton of more satisfactory to feel assured that in the "blooms produced." At the Siemens-Ander- making of comparative tests similar grades of quality had been insisted upon and sesomewhat over two tons of coal per ton of cured. Mr. Barnaby's tendency-like that a fraction of a fraction frequently written. blooms produced. Even granting that with of most intelligent engineers-is in the direclarger experience and greater attention to tion of a wider application of steel in coneconomy in the use of coal, a ton of open-struction. This is undoubtedly the right di-hearth steel could be produced, with the di-rection to work in, and while no one would further increased by the fact that it for a moment question the fairness of Mr. Barnaby's intent in these experiments, it is yet desirable that the so-called conservative the judges, "every man doeth that which crucible-steel works. The outlay in plant element, which clings so tenaciously to what seemeth right in his own eyes." and machinery for the Siemens direct process has been, should be given no pretext for doubting such results by being able to point to the natural bias of the experimenter

The Tin-Plate Duty.

Elsewhere in this issue we publish an ex parte statement, in which some of the gentlemen interested in the manufacture of tin plate in this country formulate their arguments in favor of a protective duty. In this appeal to the trade they assume to represent not only themselves and their own interests. but also the manufacturers of black and galvanized iron, pieced, stamped and retinned tinware, granite ware and kindred lines of They also assume to speak in the products. interest of the general consumer, who they believe will be benefited by a duty which, while temporarily increasing the cost of imported tin plates, will develop a domestic competition, and so raise the standard of quality while ultimately reducing the average of cost. It is scarcely worth our while to go per cent. on American breadstuffs, in the over this subject at this time, as its various aspects have been more or less fully discussed in our columns during the past five years. It will be noticed, however, by those who read these appeals to the trade, that the does not gain ground among the nations of the strongest argument advanced in favor of a world. On the contrary, it is what a gentleman protective duty on tin plates is the acknowledge. protective duty on tin plates is the acknowledged low quality of a very large part of the current importation. If the consumer responds at all to the appeal for his influence in favor of a protective duty on tin plates, it will be because of this argument, and because he believes that the development of the domestic tin-plate industry will give him what he has long wanted—trustworthy tin plates at fair prices, with a guarantee.

We are not prepared to say how the consumer will be apt to regard this matter, but we may say, in passing, that whatever force this principal argument may have it will lose if importers of tin plate set about in earnest to meet the proper requirements of consumers. It is confidently asserted and generally believed that, under the system which has grown up in this country, the refuse of the British production has been unloaded on the American market. It is also asserted and generally believed that, while as good plates are made in Great Britain as ever were made, they are not sent to this country and cannot coquetting with the following of the "Na- bought here. We are not prepared to say that this view of the case is quite true, to conceding their demands, but in the but it is certainly true that the great bulk of hope of securing their votes. Fair trade is the importation is so inferior that it probably could not be marketed elsewhere. the history of British commerce. The nar- quickest and surest way of robbing the advocates of a protective duty on tin plate of motive of every detail of her commercial their strongest argument is for the importers policy. If consumers could stand the drain to recognize, without any nonsense, the popular dissatisfaction with the present business any political or other end was to be secured methods in this trade, and, as soon as they can arrange for tin plates of old-time excelmoment to impose such a tax. Should the lence, to bring these into the country in such United States concede everything the free quantities as the trade demands, and sell

> The particulars which have recently come to hand in regard to the Panama Canal are not encouraging from a stockholder's point of view, to say the least. Twenty-six millions spent and nothing to show for it save a poor railroad property and a few bore-holes is not a satisfactory business statement. One account says that the sea-level canal is to be built and from 10 to 20 locks used instead. This would reduce the amount of cutting enormously, but the Chagres River still remains to be dealt with, and from all accounts this river is one of those exceedingly variable factors which are liable to become variable factors which are liable to become week's Iron Age, under the above head, the plus infinitum at the most inconvenient following statement appeared: "Inasmuch as at this writing there is not a single steel introducing locks it seems that one of the most stupendous dams which has ever been built will still be necessary. After the canal is done it will labor under the additional disadvantages, if all accounts are true, of passing vessels from one ocean into another at the most inconvenient points possible, where the voyage in any direction is likely to be considerably prolonged beyond what would be necessary.

There are two points in modern science which need thorough overhauling and testing, and, if possible, correcting. The thorough overhauling they are likely to get. The department on the subject of steel construction, however, is something that we tion. Such is the dilemma presented under We publish elsewhere the results of recent force, power and work. The other is the

than the confusion of ideas. In a recent article in a scientific paper we saw horsepower made synonymous with foot-pounds, the writer evidently having eliminated the factor of time entirely from what he called horse-power." In percentages we have the common absurdity of writing " cent. per cent.," and instead of giving the fraction of the whole number, we have without any means of knowing whether it is the fraction of a whole number or the no uniformity in practice anywhere, and like the children of Israel in the days of

We have no doubt that the telegraph companies are very much gratified at their victory in Chicago. It was easily won, but it would be a mistake to count too much on its permanence. The city government undoubtedly made two mistakes. The first was in directing that all overhead wires be cut on the 1st of May, and the second was in not cutting them. The telegraph companies were not at all alarmed. They simply folded their hands and said that if the wires were cut Chicago would be without telegraphic communication for an indefinite period. The result was that the Common Council passed a bill authorizing poles, and for the time the war is ended. It would, however, be folly on the part of the telegraph companies to remain indifferent to the popular demand for the removal of poles in cities, and we are glad to see them making preparations to study the subject of underground telegraphic transmission intelligently. Committees representing the different companies have been appointed to meet and inquire into the saveral systems proposed and report the results of their investigations. Poles and suspended wires have long been public nuisances, and now that public opinion is aroused on the unauthorized occupancy of house tops by companies using wires, it will not be long before the courts are stimulated to extend to property owners the protection against trespass and injury to buildings to which they are entitled. The telegraph, telephone and electric-light companies may be able to defeat the popular will for a time, but they cannot hope to resist the force of public opinion much longer than is needed to give them time to select the best and most satisfactory system of carrying wires under-

Steam is revolutionizing the trade of the St. Lawrence River. In 1856 the river was navigated wholly by sailing craft, excepting three small steamers in the Liverpool trade. Last year the number of steamers arrived at Montreal far exceeded the number of sailing vessels, while the steam tonnage, in its relaicn to other classes of shipping, was as 6 to The change, compared with 1873, appears from the following:

245,237 475,679 When the St. Lawrence is further improved the disproportion will be greater still.

The initial step in the enlargement of the Erie Canal has been taken. A bill which has passed the Legislature provides for lengthening one of the locks in such a manner as to allow the passage of two boats at the same time, thus virtually doubling the capacity of the canal. The wisdom of initaking this movement appears from the following comparison of the dimensions of the Erie and Welland canals, which are now squarely, but not fairly, matched in competition for the European trade. Erie

There are 72 locks on the Erie Canal, of which 60 must be enlarged. The work will commence after the close of navigation the coming season, and its completion will doubt-esz signalize the successful use of steam on this important branch of inland navigation.

The New Steel Cruisers.

To the Editor of The Iron Age :- In last works in this country engaged in rolling structural shapes; that the few rolling mills which might be prepared to furnish the shapes have as yet to gain all their experience in heating, rolling and dealing with steel in general; that all our great shipyards are in precisely the same position as regards the manipulation and treatment of structural steels in the shop-this invitation of the Secretary of the Navy must be looked upon either as very complimentary to our manufacturers as an expression of his confidence in their ability to overcome any and all obstacles to steel construction in a most remarkably short time, or it must be taken as an unintentional, but nevertheless very full, confession of the total ignorance of the

Cleveland Rolling Mill Co.; the Otis Steel The Iron and Metal Exchange Reor-Co.; the Spang Steel Co.; Hussey, Howe & Co.; Singer, Nimick & Co.; Shoenberger & Co., and others, are fully prepared to make steel ship plates, while the Joliet make steel ship plates, while the Joliet Steel Co., the North Chicago Steel Co., the Cleveland Rolling Mill Co., Kloman's Sons & Co., Carnegie Brothers & Co. and the Spang Steel Co. are prepared to fill orders for steel angles, channels, beams, girders, bolts and other structural shapes and indeed most of these works were actually engaged in rolling steel structural shapes at the instant the above quotation was written.

And I have no doubt but that an order for 100,000 tons of steel structural shapes for vessels can be placed for prompt delivery by American manufacturers. The new plate mills recently erected by the Otis Steel Co. Shoenberger & Co. and the Spang Steel Co are probably superior for rolling steel ship plates to any other mills of their class in the world, and for long, square-edged steel plates, we have 15 first-class Universal rolling mills of a better construction and able to do better work than any mill in Europe. Please do not discourage the Government, but let the orders be put on the market at an early day, as we need more activity, and I know of nothing that would infuse so much vigorous activity in the steel trade as a boom in steel shipbuilding. JACOB REESE. Metallurgical Engineer.

To this we would reply that either our orrespondent has not read the editorial he refers to with the care which is conducive to understanding of what one reads, or he lacks the requisite special knowledge which would be desirable in an intelligent discussion of the subject under consideration. We are obliged to Mr. Reese for the information as to the status and capacity of the different steel works which he mentions in his letter, but call his attention to the fact that, by looking over his file of The Iron Age, he will find this identical information in more elaborate form. and more correct as to details. Neverthe. less, we repeat that if the Navy Department means to complete these cruisers in the time stated-12 months and 18 months-the askng for bids on the terms mentioned is a very high compliment to the enterprise of our manufacturers, and the skill and intelligence of our workers in steel. We repeat every thing else we have said, and particularly the statement that our shipbuilders have had no experience in the management of structural steels, and add now that the experience of the French Government at Brest and L'Orient has fully demonstrated the fact that naval construction in steel brings up problems and questions the solution of which requires both time and careful study, and it no exageration to say that in the case mentioned the material proved itself first the master and then the educator of both the steelmakers and the constructors. To the experience gained in those shipyards, Terre Noire and Creuzot owe their success, also repeat that nobody believes that the Navy Department seriously contemplates the finishing of these vessels in the time specided, if at all. We recall too many similar dvertisements and their upshot.

In 1876, when Congress inquired through the Whitthorne committee for the where abouts of the American Navy, Commander Shufeldt swore to the following as his opinon: "I contend that the best ships we have ever built in our navy are being built now, The ships we are turning out to-day are as fine ships as we have ever had in the navy, and as fine as there are in the world for our purpose." These fine ships were never finished, and though millions had been squandered upon their construction, they were ultimately sold for a song-unfinished -as old iron. Straws show which way the wind blows, and a very long straw is found in the second paragraph of the advertisement, requiring that bidders shall be prepared to build both hull and engines of these ships. This excludes all but three of the shipbuilders of this country, and makes it very evident where the department means to have the contract go.

We have nothing to retract about what we have said concerning the ignorance of our naval constructors on the subject of steel construction. Perhaps they cannot help that -but this plea does not alter the fact. MrReese's "Please do not discourage the Government," is quite touching. We wish we could discourage the naval ring in their nefarious practices, but that is hopeless. As for the order being placed upon our own market, there can be no question about it. the ring has no choice in the matter, and it must be placed here, whether we discourage the Government or not. But if, as Mr. Reese states, there is sufficient capacity of output to furnish 100,000 tons of structural shapes alone on short notice, we fail to see how the placing of an order for about 10,000 tons on 18 months' time can start s very much of a boom. We are very much We are very much afraid Mr. Reese is inclined to rush inlet us say-to print.

Trade-Marks Under the New Tariff. -The new tariff provides that trade-marks which may be adopted by any American manufacturer may be deposited with the Secretary of the Treasury and distributed to customs officers, and that when so distributed no goods having such trade-mark shall be imported unless the person owning the trade-mark is the importer of the goods. Apprehensions have been expressed that under this provision American manufacturers might adopt foreign trade-marks, and so prevent the importation of foreign goods bearing the same. The opinion is entertained at the Treasury Department that, becan hardly look forward to in this genera-tion. One of these is the nomenclature of force power and work. The other is the ganization.

The rooms of the Iron and Metal Exchange Co., Limited, in Wall street, were closed April 30, and a "To let" sign is posted on the door. At the annual meeting of the New York Iron and Metal Exchange, held in their rooms on Pearl streel last Monday, the following officers were elected: President, Edward P. White; vice-president, M. B. Flynn; treasurer, T. Delnfield; managers—Carl Meyer, John J. Williams, A. G. A. Harnickel, Allston Gerry, J. H. Whitney, D. Houston, William Hagen, E. A. Caswell, J. G. Sibbald, H. B. Moore, Wm. P. Tilton and Geo. V. Tompkins, A report from the treasurer showed the cash on hand to be \$14.520.05, and the president made a review of the business of the last year. The gen-tlemen chosen at this election will merely serve ad interim, during the liquidation, and will be superseded by the officers elected by the "New York Metal Exchange," when orthe "New York Metal Exchange," when organized. The outlook for the new exchange is still a little uncertain. We believe that about 132 gentlemen represented in the membership of the two exchanges originally organized have applied for membership in new organization. However, as they l until June 1st to apply, this number will probably be somewhat increased before the end of the present month. At present there is nothing doing on the floor of the Pearl street exchange. We understand that the street exchange. We understand that the daily "call" has been abandoned, in compliance with a request from the Wall members who are coming in. Mr. E. T. Shinn is now running the price list as a private venture—ostensibly until it shall be decided whether the new exchange wishes to resume the "call." It is doubtful, however, if the membership will again care to

ever, it the membership will again care to become responsible for it. At the meeting yesterday of the Commit-tee of Twenty, the following were adopted as the by-laws of the new exchange; By-Laws of the New York Metal Exchange,

ARTICLE I.

MEMBERS.

Sec. 1.-All stockholders and associate nembers of the Iron and Metal Exchange Co., Limited, and all members of the New York Iron and Metal Exchange, shall be en-titled to membership, provided application be made on or before June 1, 1883, upon payment of \$100 by each applicant, which shall entitle him to membership and one share of the capital stock, and upon signing an agreement to abide by the by-laws and rules of the exchange, and all amendments that may be made thereto.

Sec. 2.—Whenever the exchange shall order and direct an addition to the member-ship, then each applicant shall state in writing the nature of his business and such other facts as the board of managers may require; and after ten days' notice of such application shall have been conspicuously posted upon the exchange, he shall be admitted to membership on the payment of such initiation fee and purchase of stock as may have been conditioned by the exchange, or on presentation of a certificate of membership and one share of stock duly assigned to him, and on the signing an agreement to abide by the by-laws and rules of the exchange, and all amendments that may be made thereto, if elected by the board of managers.

Sec. 3.—No person other than a stock-holder is eligible as a member of the ex-change, and no stockholder shall transfer his stock apart from his membership to any person or corporation whomsoever, on penalty of a forfeiture of such membership, and no stock shall be transferred by any member to stock shall be transferred by any member to any person other than such as shall have been first approved and elected by the board of managers and shall have paid the initia-tion fees and such other dues as are pro-vided by these by-laws, under a like forfeiture. It is further provided that no stock shall be transferred on the books of the exchange except to such persons as have been elected members thereof. held by the exchange shall be voted on at

any election.
Sec. 4.—Each member shall be entitled to receive a certificate of membership, bearing the signatures of the president and secretary, which shall be transferable upon the books of the exchange to any person eligible and elected to membership, upon th payment of a transfer fee of \$5, and any unpaid assessments due thereon. Each share of stock will be registered on the books of the exchange in the name of its owner; will will be deposited with the secretary, and will only be transferable on the books as pro-vided in these by-laws. No person shall hold ore than one share of stock in his name The certificate of a deceased member may be transferred by his legal representatives

In case of the absence of a member through nickness, or for any other urgent or proper eason, the board of managers may cause to be issued to his bona-fide partner or clerk a emporary ticket of admission to the exchange, for the purpose of transacting said member's business only, the same to be caneled on return of the member to the exchange, or at the pleasure of the board of managers. The member shall be responsible for the violation by such representative of any by-law or rule in the same manner as be answerable for all acts and contracts of the representative.

ARTICLE II.

MEETINGS AND ELECTIONS.

Sec. 1 .- The annual meeting of the mem-Wednesday in April, at half-past one o'clock p. m. (of which at least ten days' previous otice shall be given by the secretary), for the purpose of receiving the reports of the board of managers and the treasurer, and for the transaction of such other business connected with the affairs of the association as may be presented for consideration.

2-There shall be an annual election by ballot, held at the exchange, on the first Wednesday in April, for the following of-

A board of managers, consisting of a presi-We publish elsewhere the results of recent experiments made in this direction by Mr.

F. J. Barnaby. These results are presented in such form as to make the great advantage.

The other is the decimal system, especially as it relates to fractions, percentages, &c. Almost every in such form as to make the great advantage on the provents of the decimal system, especially as it relates to far and twelve managers, consisting of a president, treasurer and twelve managers, consisting of a president trade-mark used by him by proper registration in the Patent Office. No definite action and calculated to justify the Government officers in sending the orders abroad. The publish elsewhere the results of recent decimal system, especially as it relates to far the form as to make the great advantage of the force, power and work.

Abord of managers, consisting of a president, treasurer and twelve managers; a secretary, five members of an and calculated to justify the Government officers and twelve managers are presented to the trade-mark used by him by proper registration in the Patent Office. No definite action and calculated to justify the Government officers in the says.

Abord of managers, consisting of a president, treasurer and twelve managers and twelve managers and twelve managers are presented to see this statement made in this direction by Mr.

I am surprised to see this statement made in the force, power and work.

Abord of managers, consisting of a president, treasurer and twelve managers are presented to see this statement made in the force, power and work.

Abord of managers, consisting of a president trade-mark used by him by proper registration in the Patent Office.

I am surprised to see this statement made in the force, power and twelve to the force, power and twelv

BLOWERS. HAND



Warranted Superior to any other make, and

Guaranteed to give Perfect Satisfaction.

For sale by all the leading

Iron, Hardware and Machinery

Dealers throughout the count

FORGE COMPANY

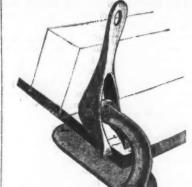
BUFFALO, N. Y.

Send for Complete Catalogue.

10 Inch, 12 Inch,

14 Inch,

KENNETTS



For Carpenters', Builders', Painters' and Masons' Use.

Without doubt the BEST Bracket in use. made of MALLEABLE IRON, is LIGHT, STRONG and DURABLE, is SELF-ADJUSTING and makes no holes in the roof. SEND FOR PRICE.

W. H. HETZEL & CO., SYRACUSE N. Y.

CLAY

AND TRAPS. WHOLESALE ONLY. AGENTS WANTED.

ADDRESS :

THE CLAY PIGEON COMPANY, 166 Main Street, CINCINNATI, OHIO.

BUFFALO PORTABLE FORGES AND PATENT ROOF BRACKET, LIVINGSTON HORSE NAIL CO.

GAUTIER STEEL DEP'T

OF CAMBRIA IRON CO.

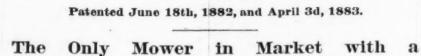
Removed Have

TO

No: 104 Reade Street,

NEW YORK.

The Knickerbocker Lawn Mower, PATENT GARDEN ROLLER.



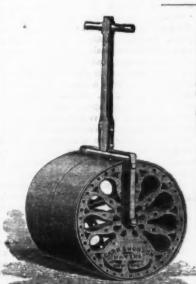


Incomparably the Lightest Running and Best Made Machine in Existence.

MANUFACTURED ONLY BY

CARR & HOBSON, Limited

AND SOLD BY



We are now making our new Patent Garden Roller, as shown by the cut herewith, in six different sizes, varying in weight from one which a lad can push to a size which is almost which a lad can push to a size which is almost heavy enough for a pony. Each size is made of two sections, revolving independently upon a wrought-iron axle, either half thus acting as a pivot upon which to turn sround when necessary. These rollers never mar the turf as do those made of a single section, and they are also less expensive than any other well-finiched appliance of the kind.

Our patented device for holding the handle in an upright position when net in use will be appreciated by all who are familiar with the oid-fashioned drop-handle rollers, and our ornamental end-plates are an attraction not to be found in any other implement of this class in market.

No.	T.	weight,	150	lbs.,	0	0	\$12.
6.6	2.	64	200	4.6			16.
.6.6	3,	4.4	250	6.6			20.
4.6	4.	8.6	300	6.6			24.
6.0		4.6	400	6.6		0	32.
6.6	5,	6.6	500	4.6		0	40.

325 Broadway, New York.

WOOD & WROUGHT IRON SHELLS.

PENFIELD BLOCK CO., Lockport, N. Y. HENRY B. NEWHALL CO, 105 Chambers St., New York & 47 Pearl St., Boeton,
(J. H. Work, Manager.) Eastern Agents.

S. H. & E. Y. MOORE. 163 & 165 Lake Street, Chicago Agents.



PHILADELPHIA PA.





WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw We make the following lengths, 31/4, 4, 4/4, 5 feet. Send for sample.

WHEELER, MADDEN & CLEMSON MFG. CO., Middletown, N. Y.

IMPROVED UNDER PATENTS OF 1875 AND 1876.

Safety, Economy in Fuel, Low Cost of Maintenance, Dry Steam without Superheating, Large Reserve Power ARE THE TADVANTAGES OFFERED BY THIS BOILER IN A PRE-EMINENT DEGREE.

3000 Horse-Power in Progress and for Immediate Delivery. Correspondence Solicited.

EDGE MOOR IRON COMPANY,

SOLE LICENSEE AND MANUFACTURER FOR THE UNITED STATES.

POST OFFICE, WILMINGTON, DELAWARE.

Philadelphia Office, 1600 HAMILTON STREETS

New York Office, 79 LIBERTY STREET.

WM. SELLERS, Pres. JNO. SELLERS, JR., Vice-Pres. ELI GARRETT, Sec. and Treas. GEO. H. SELLERS, Gen. Supt.

A. FIELD & SONS.

Of Every Quality and Description.

Taunton, Mass., and 78 Chambers Street, New York.



Post's Waterproof Belt Oil and Leather Preservative,

Leather dressed with this oil will not crack or rot, as heat, cold, water er gas has no effect on it. It will pread one-third further and la t much longer than any oil for the same purpose. It never turns rancid; will keep in any climate.



Belts may be run Belts may be run in water at one end, and a hot room at the other, and still be soft, dry and pliable. Warranted not to start glue laps or gum on belts or pulleys, and to keep the surface perfectly smooth.

E. L. POST & CO., No. 10 Peck Slip, N. Y., WIRE NAILS

SOLE MANUFACTURERS.

AGENCIES IN THE UNITED STATES:

AGENCIES IN THE UNITED STATES:

B. Hoyt & Co., New York.
& H. Phillips. Pittsburgh, Pa.
B. Faraum, Woonsceket, R. I.
D. Barr, Buffalo, N. Y.
B. Preston & Co., Minneapolis, Minn.
ost & Co., Cincinnati, O.
B. Williams & Sons, Dover, N. H.
B. Hoyt & Co., Chicago, Ill.
anglois & Son, Racine, Wis.
aurence & Herkner. New York.

AGENCIES IN THE UNITED STATES:

J. Le Roy Pine, Troy, N. Y.
Jas. H. Billington & Co., Philia, Pa.
Brown Bros. & Co., Providence, C.
R. I.
Jas. Hoytington & Co., At lants, Ga.
Sanford & Covel, Fall River, Mass.
J. Ashton & Son, Trenton N. J.
Geo. A. Smith, Richmond, Va.
W. H. Dillingham & Co., Louisville, Ky.
E. G. Studley & Co., Cincinnati, Ohio.

SCOTLAND: Robert Balderston, Glasgow.

The Medart Patent Wrought Rim Pulley



THE LIGHTEST, STRONGEST, BEST BALANCED,

Absolute Satisfaction Guaranteed.

SEND FOR PRICE LIST. MEDART PAT. PULLEY CO., 105, 107 S. 7th St., St. Louis, Mo.

LEWIS'S PATENT BELT PROTECTOR is meeting with a demand entirely beyond all anticipation. The following, however, tells the story of its signal success:

ALBANY ELECTRIC ILLUMINATING Co., ALBANY, April 21, 1883.

Mr. E. S. Lewis: Sir.—We are now using your BELT PROTECTORS on several of our belts, and as they give perfect satisfaction, I intend applying them as occasion may require.

Yours, &c.,

E. A. MAHAR, General Manager.

FOUNDAY FACINGS AND FOUNDERS' SUPPLIES, ALBANY, N. Y., March 31, 1883.

Mr. EDWARD S. Lewis: Dear Sir.—It affords us great pleasure to state that your "I PROTECTORS," which were applied to the belts in our mill last fail, have been the means of sus considerable expense, inasmuch as we should have been compelled to replace them at conside outlay, whereas now they are in as good condition as when put in, with every prospect of rema so for a long time to come.

R. D. RANSOM & CO. so for a long time to come.

R. D. RANSOM & CO.

NEW YORK DEFOT AND AGENCY:

DEWEY MFG. CO., 29 Chambers St.

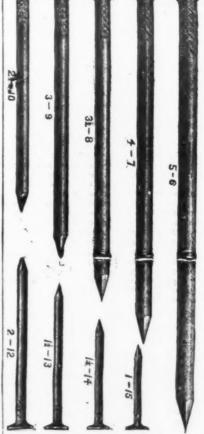
SOLE MANUFACTURER AND PROPRIETOR, EDWARD S. LEWIS, 16 Herkimer St., Albany, N. Y.

SIDING. CEILING. Patent Cap Seam Roofing, in Four Styles. In Sheets or Rolls,

Crimped Iron, for Siding or Roofing for Elevators, Mills and Factories. Paneled and Crimped Iron Ceiling. Durable, Attrac-tive, Fire-proof. Send for Prices and Circulars to

A. NORTHROP & CO., 97 First Ave., PITTSBURGH.

THE IP NAIL CO.,



Hinge Nails, Wire Spikes for Track, Bridge Hinge Nails, Wire Spikes for Track, Bridge and Dock Work, Tinned Nails, Galvanized of the proceedings of the board of managers and of all meetings of the exchange; shall

T.NEW'S PREPARED

NELLIS, McINTIRE & CO. Hanniactaren Belia" Electric Spring Igitatera,
For Cultivatora, Harrowa, Seedern and
Suncothing Harrowa.
Mellia" Original Harpoon Heres Hay Fork, Hellia"
Orappie and Wood Whose Pelleys, Hellia" Cast Teel
Steel Cast.ngs, Mellia" Oramental Foncings, Saliings and Crowings, Agricultural Stoels of all Inda,
Gracible Cast, Iron Genters, and Open Hearth Seells.
Fost Augers and Diggers, &c.



ICE CREAM FREEZERS. TORREY'S PATENT, S. ROEBUCK & CO.,

Manufacturers, 164 FULTON ST., NEW YORK.

VARIETY METAL BOOM. Iron Foundry and Machine Shop. STEAM HEATING BY DIRECT RADIATION in all its Branches a Specialty. Brass and other Metal Moulding, Casting and Finishing. No Vertical Engines, Hydrants, Fire Plugs, &c.

PRAS. B. BANNAN, Pottaville, Schuylkill Co., Pa.

HEATHFIELD, EYRE & CO.

158 Leadenhall Street, LONDON, ENGLAND.

Scrap Iron, Old Rails, Pig Iron, &c., &c., quoted at owest cfi prices. Cable Address 64 Gentian, ??

change, of which at least 24 hours' previous change. They shall appoint such clerks, notice shall be given to each member by the secretary by mail. Meetings for other purposes may be called by the president upon the written request of a majority of the board of managers, similar notice being given and observed. The board of managers of his duties, such bond to be made payable may, in their discretion, upon like notice, submit to the members for their approval by ballot any question directly connected with the affairs of the association not otherwise provided for in these by-laws, and a majority of the votes cast shall determine such question.

Sec. 4.—At all meetings of the members of the exchange 30 members present shall con-

stitute a quorum for the transaction of business, but in any case a less number than the prescribed quorum shall have power to adjourn to a future time, which time shall be

** ARTICLE III. OFFICERS.

Sec. 1.—The president shall preside at the meetings of the exchange and of the board of managers, and shall be a nember expected of all standing committees (except the Arbitration Committee). He shall also, at the annual meeting of the members of the exchange, and at such other times as he shall deem proper, communicate to the exchange or to the board of managers such matters as may, in his opinion, tend to promote the prosperity and welfare and increase the usefulness of the exchange, and shall perform such other duties as are incidental to the office of president of the exchange. He shall also countersign all certificates of stock and membership, and checks for the payment of

Sec. 2.-In case of the death or absence of the president, or of his inability from any cause to act, the vice-president shall perform the duties of the president, and in case of the absence of both president and vice-president, then the board of managers shall ap-

point one of their number to perform the duties of president for the time being.

Sec. 3.—The treasurer shall receive all sums due to the exchange, and, under the direction of the board of managers, shall interest described. orrection of the board of managers, shall invest, deposit and disburse the same. He shall not pay out any of the funds of the exchange unless authorized by the board, and then only under the direction of the Finance Committee. All disbursements amounting to \$10 or more shall be made by checks signed by the treasurer and countercarefully preserve all vouchers for the payment of money, and all bonds and securities of every kind belonging to the exchange. He shall render a monthly account a each regular meeting of the board of managers, and an annual report to the exchange at the signed by the president or vice-president. He shall keep regular books of accounts, and and an annual report to the exchange at the annual meeting thereof, all of which reports shall be audited and approved by the Finance Committee before presentation. The funds, books, vouchers and securities in his hands, shall at all times be under the supervision of the board of managers, and subject to its inspection and control. He must be required by the board to execute a bond, with two sufficient sureties, approved by the board in a penal sum to be fixed by the board of managers, for the faithful performance of his duties, and at the expiration of his term OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass
Nails, Cast Steel Wire Brads, Cast Steel
Wire Finishing Nails, Cigar Box Nails, Escutcheon Pins, Wagon Nails, Clinch Nails,
Hinge Nails, Wire Spikes for Track, Bridge

and of all meetings of the exchange; shall immediately post conspicuously upon the bulletins of the exchange all reports from the inspectors of elections; shall conduct the correspondence of the exchange and of the board of managers, under the direction of the president, and shall have custody of the seal of the exchange. He shall, under the supervision of the Executive Committee, have charge of the buildings or rooms occupied by the exchange, and shall cause them to be supplied with necessary stationery, and three members of the board of managers.

5. A Warehouse Committee, to consist of five members, two of whom, including the chairman, shall be members of the board of managers; the other three shall be selected from among the members of the exchange.

6. A Committee on Trade, to consist of two members, to be composed and appointed in the same manner as the Warehouse Committee.

7. A Complaint Committee, to consist of two members, two of whom, including the chairman, shall be members of the board of managers; the other three shall be selected from among the members of the exchange.

6. A Committee on Trade, to consist of two members, two of whom, including the chairman, shall be members of the board of managers.

7. A Complaint Committee, the consist of two members, two of whom, including the chairman, shall be members of the board of managers.

8. A Warehouse Committee, the chairman, shall be members of the board of the exchange.

8. A Committee on Trade, to consist of two members, two of whom, including the chairman, shall be members of the board of managers; the other three shall be selected from among the members of the exchange.

8. A Committee on Trade, to consist of two members, two of whom, including the chairman, shall be members of the board of the exchange.

8. A Committee on Trade, to consist of two members of the exchange.

9. A Complaint Committee, the consist of the exchange of the board of managers. We make Whole Pulleys from 9 inches to 96 inches diameter, and Split Fulleys from 18 inches to 60 inches diameter, All widths of face up to 32 inches straight; also tight and loose and Double Arms.

For steep or nat roofs. Applied by ordinary work, men at one-thind the cost of tin. Circulars and to be supplied with necessary stationery, and three members of the board of managers, and shall cause them to be supplied with necessary stationery, and three members of the board of the properly heated, cleaned, ventilated, and kept in order and repair. He shall have charge of the books and documents of the president shall thereupon appoint his successor. ness of the exchange, to be posted upon the bulletins in a neat, correct and orderly manner. He shall sign all certificates of the same of their appointments. treasurer), and shail cause all information, statistics and notices pertaining to the busiand of membership, and attach the seal of the corporation thereto, and shall perform such other duties incidental to his office as may, from time to time, be required of him by the board. He shall hold his office at the pleasure of the board, and shall not be in any business connected with the metal trade, and in case of a vacancy in the office of secretary, it shall be filled by the board of managers until the next annual election.

president and secretary, and such return shall be posted at once in the exchange.

Sec. 6.—Any vacancy that may occur among the inspectors of election, from any cause, or the temporary absence of any inspector, when such inspectors are required to act as a board, may be filled or supplied by the president; or in his absence, by the remaining inspectors present.

ARTICLE IV.

BOARD OF MANAGERS.

Sec. 1 .- At the first meeting of the board of managers after the first election, they

The polls shall be opened at eleven o'clock and closed at two o'clock, and every member holding in his own name a certificate of the exchange shall be under the control of the exchange shall be under the control of the board of managers. Any vacancies that may occur from any cause in the board, not votes cast shall constitute a choice.

Sec. 3.—The president may, and upon the written request of the board of managers or 25 members of the exchange shall, call special meetings of the members of the exchange shall provide and regulate suitable rooms for the exchange, of which at least 24 hours' previous

to the exchange.

MEETINGS OF THE BOARD.

Sec. 3. Regular meetings of the board of managers shall be held on the first Thursday managers shall be held on the first Inursday of each month, except when the same shall fall on a legal holiday, in which case it shall be held on the following Tuesday; but the president may, when he deems it necessary, president may, when he deems it necessary, or at the request of three members of the board shall, call special meetings of the board. Eight members present at any meeting shall constitute a quorum for the transaction of business.

Sec. 4.—The following order of business shall be observed at all meetings of the board of managers, and no business shall be taken out, of the regular order except by

taken out of the regular order, except by unanimous consent, viz:

r. Calling of roll.

- Reading minutes of preceding meeting. Report of the treasurer.
- Reports of standing committees. Reports of special committees.

Unfinished business. Resolutions, motions and notices.

Miscellaneous business. Sec. 5.—If any member of the board of managers shall absent himself from two consecutive regular meetings of the board, without sending a communication to the president stating a good and sufficient reason for so doing, his seat in the board may be

declared vacant by the board. Sec. 6.-No officer or member of the board of managers shall contract any debt on behalf of the exchange, or in any manner or to any extent render the exchange liable for the payment of any sum, unless the same shall first have been directed by the board of managers; and no debts shall be contracted or money expended by the board of man-agers, except for the legitimate business of the exchange, and no appropriations of money for any other purpose shall be voted, except by the exchange.

ARTICLE V.

ARBITRATION COMMITTEE.

Sec. 1. The Arbitration Committee shall consist of five members of the exchange who are not members of the board of managers,

and disputes between members of the ex-change which may be submitted to them, and may adopt such forms of proceedings as

ARTICLE VI.

COMMITTEES. Sec. 1.—At the first meeting of the board of managers after their election, the president shall, subject to their approval by the board, appoint the following committees,

I. An Executive Committee, to consist of three members of the board of managers.

2. A Finance Committee, to consist of three members of the board of managers.

3. A Law Committee, to consist of three

members of the board of managers.
4. A Floor Committee, to consist of the secretary and two members of the board of

managers.
5. A Warehouse Committee, to consist of

purposes of their appointments, as herein-after prescribed, and such as may be re-quired of them, from time to time, by the board of managers.

EXECUTIVE COMMITTEE.

Sec. 2.—The Executive Committee shall have, subject to the board, general super-vision of the property, business and affairs of the exchange, and shall make such reports and recommendations as, in their judg-ment, will best promote its interests; shall sec. 5.—It shall be the duty of the inspectors of election to receive the votes at each appointed officers and employees in the discharge of their respective duties, and see charge of their respective duties, and see election held during their term, to canvass charge of their respective duties, and see them immediately after each election, and make a return thereof immediately to the and kept in good order for the accommodation of the exchange, the board of managers

FINANCE COMMITTEE.

Sec. 3.-The Finance Committee shall sec. 3.—The Finance Committee shall audit all bills or claims against the exchange, shall direct all payments, deposits and investments authorized by the board of managers, and shall audit the accounts of the treasurer monthly, before presentation to the board, and also his annual account, before presentation to the exchange.

LAW COMMITTEE.

Sec. 4 .- The Law Committee shall have of managers after the first election, they shall divide the members into three classes, the first to serve three years, the second two years, and the third one year, and at each first prices. Cable Address (Gentian, Sc., &c., quoted at the prices, Cable Address (Gentian, Sc.)

THE IRON AGE BOOK DEPARTMENT.

ENGINEERING.

Armstrong .- Construction and Management of Steam Boilers. By R. Armstrong, C. E., with an appendix by Robert Mallet, C. E.; 8th Armstrong, C. E., with an appendix by Robert Mallet, C. E.; 8th edition, illustrated, 184 pages, 12mo, cloth; 1878 \$0.75 12mo, cloth; 1878

The principles and rules are given for the proper proportions and lengths of boilers; also practical instructions for setting up. There are examples of the strength and durability of boilers, and a chapter on the causes

Baker.—Land and Engineering Surveying. By T. Baker, C. E.; new edition, 231 pages, 12mo, cloth; London (Weale's series), 80.80

A rudimentary treatise on the subject. Students and practical men who have not studied the higher mathematics will find everything of importance in this little book.

Lardner .- The Steam Engine. By Dr. D. Lardner; 13th edition, 132 pages, 12mo, cloth. . \$0.75

This little book, in simple language, supplies an explanation of the facts and mechanical principles pertaining to the structure and operation of steam engines, without entering into practical details.

Edwards.—Modern American Ma-rine Engines, Boilers and Screw Propellers. By Emory Edwards, M. E.; 30 large plates, 146 pages, 4to, cloth; 1881

Glynn.-Construction of Cranes and other Hoisting Machinery. By Joseph Glynn; 6th edition, numerous illustrations, 122 pages, 12mo, cloth. London . .

A brief history of the early methods of hoisting, showing the progress made. There are descriptions of the machinery of cranes, strength of chains and ropes, and necessary foundations for fixing and securing cranes.

Harrison.—The Mechanic's Tool Book. By W. B. Harrison; 3d edition, 44 illustrations, 278 pages, 12mo, cloth; 1882. . . \$1.50

This book is especially adapted to machinists and ironworkers in general. It is made up of the workday experience of an intelligent and ingenious mechanic, who describes many useful plans and suggestions for labor-saving in a practical and intelligible manner.

King.—Notes on Steam. By the late W. R. King, U. S. N.; revised by Chief-Engineer J. W. King, U. S. N.; 19th edition, enlarged, illustrated, 229 pages, 8vo, cloth;

These practical lessons on steam engines, propellers, &c., are especially adapted to young engineers and students. They consist of extracts from the author's journal on the action of valves and the indicator, the management of boilers, casualties and their remedy, and an appendix on materials and the elements of machinery.

**Byling of Pipes, &c.

**Du Bois.—Hydraulics and Hydraulic

Motors. Translated by Prof. A.

J. DuBois, from the 4th edition of "Weisbach's Mechanics;" 380 illustrations, 675 pages, 8vo, cloth; 1878. These practical lessons on steam engines,

Rose. - Complete Practical Machinist. By Joshua Rose; 8th edition, revised and enlarged, 196 illus., 441 pages, 12mo, cloth .

This is a handbook of lathe and vise work, This is a handbook of lathe and vise work, with descriptions of the various tools and processes employed. It embraces drills and drilling, hardening and tempering, taps and dies, together with instructions for the making and using of tools. Attention is given to milling machines and tools, and directions for calculating the speed of wheels and pulleys are presented. Various kinds of pumps are described, and the slide-valve is treated, with directions for setting the same.

engines, it will also contain descriptions and illustrations of other machinery, such as dredges, engines for cable-towing systems on rivers and canals, &c.

Marks.—Relative Proportions of the Steam Engine. By Prof. Wm D. Marks; 29 illustrations, 161 pages, 12mo, cloth; 1878 . \$1.50 The engine designer will find this an instructive work, in that it will enable him to calculate with certainty not only sizes and strengths with present materials, speeds and pressures, but also to use other materials or pressures and still be able to be sure of his results. Portions of the mathematics are difficult, but aside from this fact the book contains much valuable matter, and is one of

has ever been issued, Roper.—Handbook of the Locomo-tive. By Stephen Roper; 9th edition, illustrated, 324 pages, 18mo, tucks, gilt edges; 1881. . \$2.50

the best works on American practice that

This volume is one to which the locomotive mechanic can turn for information re-garding almost every branch of his trade. There are chapters on heat, combustion, water, air, gas and steam. The construction, care and management of boilers and engines are described in detail; also tables of strength of materials, and practical hints for the guidance of the engineer.

Rose. - Mechanical Drawing Self-Taught. By Joshua Rose; 330 engravings, 313 pages, 8vo, cloth;

adapted to the practice of American machin-ists. It comprises instructions in the seleclists. It comprises instructions in the selec-tion and preparation of drawing instruments, with elementary instruction in practical me-chanical drawing. The illustrations give examples in simple geometry and elementary mechanism, including screw-threads, gear wheels, mechanical motions, engines and

HYDRAULICS.

Leffel.—Construction of Mill Dams. By James Leffel & Co.; 58 illustrations, 312 pages, 8vo, cloth;

The approved methods of building mill-dams are thoroughly explained and illus-trated by full-page engravings of dams in different sections of the country. The work also comprises the building of reservoirs, mill races and gates, the measurement of streams, the gauging of water supply, &c.

Grier .- Rural Hydraulies. By W. W. Grier; illustrated, 35 pages, 8vo, cloth; 1877

by In plain and practical terms the author outlines methods for supplying water to country houses, giving full descriptions of springs and wells, pumps and hydraulic rams, with instructions in cistern building, laying of piece. laying of pipes, &c.

Motors. Translated by Prof. A. J. DuBois, from the 4th edition of "Weisbach's Mechanics;" 380

This work consists of numerous practical examples for the calculation and construction of water-wheels, including breast, undershot, back-pitch and ove . \$2.50 well as a special discussion of the various forms of turbines.

> Bayles .- House Drainage and Water Service. By James C. Bayles; 4th edition, 3 folding plates and 30 illustrations, 365 pages, 8vo, cloth;

IRON, STEEL AND METAL-LURGY.

Bloxam.—Metals; Their Properties and Treatment. By Prof. C. L. Bloxam; 105 illustrations, 312 pages, 12mo, cloth; 1872. . \$1.50

With an absence of technicalities, the author distinguishes the properties of the useful metals and their mechanical preparation in such a practical manner that the chemical principles involved may be clearly understood

Bauerman.—Metallurgy of Iron. By H. Bauerman; 5th edition, revised and enlarged, 58 illustrations, 515 pages, 12mo, cloth .

This work treats of the physical properties of iron ores, and the most approved means of reducing them to the purposes of the man-ufacturer. The methods of assay and analyses of iron ores are practically considered, as also their composition and distribution. The subject of blast furnaces, their capacity and subject of blast furnaces, their capacity and production, has also received careful attention. In the present edition the author has added to the chapter on Steel Making, and has explained and illustrated the progress recently made in the process of steel manufacture, both of Siemens and Bessemer, especially the latter, by the adoption of lime as a dephosphorizing agent. The book also contains a chapter on the mechanical properties and tests of Malleable Iron and Steel. The author has succeeded in his avowed attempt to supply much practical and reliable infor-This work will be found to be thoroughly to supply much practical and reliable information for ironworkers and othe 'u condensed form.

> Kirk .- Founding of Metals. By Ed. ward Kirk; 4th edition, 21 illustrations, 272 pages, 8vo, cloth; 1881.....\$2.50.

These notes contain the observations and experience of the 10 years' practice of a practical foundryman and chemist. Omitting chemical and technical terms, the author treats upon the forming of alloys and presents a general description of all the metals, minerals and gases used in the art of founding.

West.—American Foundry Practice. By Thomas D. West; illustrated, 391 pages, 8vo, cloth; 1882...\$2.50

A practical treatise on the management of cupolas and the melting of iron. The author, a practical foundryman, treats of the molder and his trade, green-sand molding; loam and dry-sand molding, and the manipulation of iron castings. The work is a valuable addition to the list of books upon this subject.

De Koninck-Dietz. - A Practical Manual of Chemical Analysis and Assaying. By L. L. De Koninck and E. Dietz; American edition, edited with notes and an appendix on iron ores, by A. A. Fesquet; 282 pp., 12mo, cloth, 1873 . \$2.50

This work treats exclusively of chemical analysis and assaying as applied to the manufacture of iron from its ores, and to cast iron, wrought iron and steel. The apparatus and operations are described, and there is also a chapter on the assay of fuels.

Davies. - Metalliferous Minerals and

This book is an excellent and systematic description of the conditions under which metallic ores are found in the different countries of the world. It explains the origin of deposits, and defines the localities occupied the various metallic ores, with practical details in the working of mines and the

ARCHITECTURE AND CAR-PENTRY.

Building a Home. By Alexander F.
Oakey; 125 pages, 4 by 7 inches,
illustrated, flexible cloth . . \$0.60

Rudiments of Architecture and Building. By John Bullock; 468 pages, 6 by 91 inches, 215 engraving elo h \$3.50

This work consists of two general divisions, the first being a history of the rudiments of architecture, and the second the rudiments of the art of building. The several orders of architecture are first described, following which are sketches of the history and description of the styles of architecture of the which are sketches of the history and de-scription of the styles of architecture of va-rious countries. In the second part of the book general principles of construction are considered, following which is a section on materials used in building. The strength of materials and the use of materials are care-fully discussed. A chapter on making draw-ings preparing specifications and estimates. ings, preparing specifications and estimates and drawing contracts completes the work. The book will be found valuable by those who are sudying architecture or the building business. An illustrated glossary of architectural terms is a leading feature in the

Street, Store and Bank Fronts. By A. J. Bicknell; 22 full-page plates, with accompanying descriptive text, 10 by 14 inches, cloth . . \$4

The plates of this work are Nos. 67 to 89, inclusive, of "Wooden and Brick Buildings." It contains 34 designs of street fronts for dwellings, stores and banks, with several plates of details.

American House Carpenter. By R. G. Hatfield: 685 pages, 6 by 9½ inches, 450 illustrations, cloth. \$5 The first part of this book, embracing some

The first part of this book, embracing some 300 pages, is architectural and mechanical in character. The divisions are architecture, construction, stairs, doors and windows, moldings and cornices. Approved construction is presented, with illustrations of the principles upon which they depend. Strains and thrusts, and the best means of providing necessary strength, are presented in an intelligent and comprehensive manner. Simtelligent and comprehensive manner. Simple formula is freely used, but in such a way ple formula is freely used, but in such a way as to make its presence no disadvantage to the book. The second part is mathematical in character, the subjects being geometry, ratio and proportion, fractions, algebra, polygons, circle, ellipse, parabola, trigonometry, drawing and shadows. An appendix contains a glossary, tables of squares, cubes, &c., and a comprehensive index. The work is standard in character, and is alike valuable to the architect, engineer and common mechanic.

National Carpenter and Joiner. By James H. Monckton; 172 pages, 9 by 12 inches, illustrated with 86 plates, cloth . . . \$5

This is a complete work on constructive before the public for some time, and it has become deservedly popular.

Modern House-Carpenter's Compan-ion and Builder's Guide. By W. A. Sylvester; 35 full-page plates, 114 pages, 5½ by 7½ inches, cloth; 1882. . . \$1.25

CONSTRUCTION AND MATERIALS.

Oakey; 125 pages, 4 by 7 inches, illustrated, flexible cloth . \$0.60

The New York World says: "Mr. Oakey discusses house building for the purposes of people of moderate means in the Middle States, and give: plans and elevations of cottages, from the very cheapest to a house to be built at a cost of \$9000. The conditions of building with reference to the climate and material are fully set forth, and the class of readers whom the book contemplates will find it of advantage." This work will be found of more service to those who are contemplating building, and who are discussing features of arrangement and construction, than to those who are in need of a selection of finished designs from which to make selection. are sold separately.

Vol. I. Elementary Course, 219 pages, 6 by 9½ inches; illus. with 325 woodcuts, cloth \$3.50

The general divisions of the elementary course are as follows: Walling and Arches, Brickwork, Masonry, Carpentry, Floors, Partitions, Timber Roofs, Iron Roofs, Slating, Plumbers' Work, Cast-Iron Girders and Joinery. Each of these subjects is treated extensively under numerous subjects. extensively under numerous sub-heads

Vol. II. Advanced Course; 463 pages, 6 by 9½ inches, illus. with 237 woodcuts, cloth . \$3.50

237 woodcuts, cloth . . . \$3.50

The titles of chapters in Volume II are as follows: Brickwork and Masonry, Timber Roofs, Roof Coverings, Built-up Beams, &c; Centers, Joinery, Stairs, Riveting, Fire-proof Floors, Iron Roofs, Plasterers' Work, Painting, Paper Hanging and Glazing. So far as these subjects correspond to those mentioned in Volume I, they are, in effect, a continuation of the consideration there commenced. Volumes I and II together constitute the most complete exposition of building practice now in print. now in print.

Vol. III. Materials; 503 pages, 6 by 91 inches, illustrated by 188 woodcuts, cloth

The third volume is devoted to a consideration of the materials which enter into the construction of buildings. The chapter headings are: Stone, Brick, Tiles, Terra Cotta, &c.: Limes, Cements, Mortar, &c.: Metals, Timber, Paints and Varnishes, Glass, Paper and Miscellaneous Materials. The characteristics of each of these materials, with directions for examination and selection and the best practice in working, are presented in an attractive manner. This volume has fewe illustrations than either of the other two although it is much larger. It is more scien tific in character than those we have just described, but it is not any less valuable to the student or mechanic. The third volume is devoted to a consider-

MISCELLANEOUS.

Woodbury.—Fire Protection of Mills. By C. J. H. Woodbury, M. E.; with many illustrations, 196 pages, 8vo, cloth; 1882. . . . \$2.50

A practical and scientific view of the best A practical and scientific view of the beat methods to prevent conflagrations in cotton, flour and other mills, showing forms of apparatus for extinguishing flames, with a chapter on the proper construction of floors and proportioning of floor beams. Also a thorough explanation is presented of the electric light as applied to mills, and the regulations for its use adopted by the insurance companies.

Hood .-- Practical Treatise on Warming Buildings by Hot Water, Steam and Hot Air. By Charles and Hot Air. By Charles Hood; enlarged edition, 462 pages, 8vo, illustrated with numerous cuts, cloth . . . \$4.25

at th

of t shall mem

sary, The paya board shall

paid.

tificat

Sec. busine holidar rules a lish; I time w pedient Sec. change for the given by the bull

This book is divided into two general parts. The first subject considered in Part I is warming buildings by hot water. The subjects of circulation, permanence of temper-ature and construction of furnaces are carefully considered. Following this is an esti-mate of the heating surfaces required to warm any description of building. A chap-ter on heating by steam, another on heating by hot air, and two on the laws of phenomena by hot air, and two on the laws of phenomena of heat complete this division of the volume. Part 2 gives attention to the various methods of warming and ventilating buildings, the combustion of fuel, forms of fireplaces in chimneys, a chapter on the changes pro-duced in atmospheric air, heat, combustion and respiration; a chapter on the various methods of producing ventilation, and one on the chemical constitution of coal and the combustion of smoke.

Any book published will be sent, postpaid, to any address in the United States or Canada, on receipt of price. All inquiries relating to books will be promptly answered. Remittances may be made by banker's draft on New York, Post Office order or registered letter, at our risk. Currency or stamps inclosed in common letters must be at the risk of the sender. United States stamps of small denomination may be sent for all sums less than \$1. Address all communications to

DAVID WILLIAMS, Publisher and Bookseller,

83 READE STREET, NEW YORK.

suitable counsel, to represent and protect the interests of the exchange in any suits at law that may arise, or for the examination Sec. 3. of titles to real estate of which the exchange may become possessed and to render general legal services. Any proposed amendment of the by-laws shall be submitted to them, and they shall report on the same to the board.

FLOOR COMMITTEE. Sec. 5.—The Floor Committee shall have general supervision over the rooms used by the exchange during 'change hours, see that proper order is kept, and that no unauthorized persons are admitted on the floor. All applications for membership shall be referred to them, and they shall report on the same

to them, and they shall report on the same to the board of managers. WAREHOUSE COMMITTEE.

examine into and pass upon an applica-tions for licenses as warehousemen, weighers, inspectors, truck owners and owners of lighters, and refer the same to the board of managers with their recommendation for final action; shall adopt such rules and regulations for the guidance of licensed parties as they may deem necessary, and shall report the same to the board. Upon complaint of misconduct on the part of any person licensed by the board (which compensor licensed by the board of the part of th person neesed by the board (which con-plaint must be reduced to writing, and veri-fied by the party making it), they shall summon the accused and accusers before them, and shall sit as a court of inquiry in such case or ca es, take testimony, and submit the same, together with their recommendation, to the board.

The committee may, in its discretion, suspend the license of any person or persons, pending the final action of the board. COMMITTEE ON TRADE.

The Committee on Trade shall consider, and from time to time report to the board, such rules and regulations as to the purchase, sale, transportation and custody of metals as they may consider beneficial to the interests of the exchange.

COMPLAINT COMMITTEE.

Sec. 8.-Any member of the exchange who shall be accused of a wilful violation of the by-laws, or fraudulent breach of contract, by-laws, or fraudu'ent breach of contract, or of any proceeding inconsistent with just and equitable principles of trade, or of any other misconduct, shall, on complaint, be summoned before the Complaint Committee, when, if he desires, he shall be heard in his defense. Should the committee be unable to conciliate the disputants or induce them to arbitrate, and the circumstances seem to warrant, the complaint shall be referred to the board of managers, when both parties shall have an opportunity to be both parties shall have an opportunity to be heard again in person, prior to final action in the case; and if, in the opinion of the board, the charge or charges against said deit may, by a vote of not less than two-thirds of all the members present, censure, sus-pend or expel such member from the ex-change. fendant are sufficient, and be substantiated Sec. q.—All complaints which may be

made against members of the exchange shall be made in writing, and addressed to the chairman of the Complaint Committee, who shall cause a copy thereof to be transmitted to the member against whom the complaint shall have been entered, previous to his being summoned to appear before said committee, as provided for in Section 8.

Sec. 10.—To reinstate an expelled member,

and voting at the meeting at which the application for such reinstatement shall be acted upon; but a suspended member may be reinstated by a majority vote at any meeting of the board of managers.

Charcoal Pig Iron in 18

Sec. 11.—Reports of committees shall be made in writing to the board, and signed by a majority of the committee. Minority reports may be submitted. A majority of any standing or special committee shall consti-

shall consist of such number as may be in 1882, compared with 1881 and 1880, in net tons of 2000 pounds, according to fuel mentioned, which committees shall hold office

Kinds of fuel. 1880, 1881, 1882. at the pleasure of the board.

ARTICLE VII ANNUAL DUES.

For the purpose of defraying the expenses of the exchange, the board of managers shall annually assess upon each certificate of membership such sum as it shall deem neces-

ry, but not exceeding \$50.
The amount of such assessment shall be payable at the exchange at such time as the board may designate, and any person who shall fail to pay the same after thirty (30) days' written notice by the treasurer so to do, whell be treasured from the privilege of the shall be suspended from the privileges of the exchange until the same shall have been

If such assessment remain unpaid for the period of three months after a notice to pay the same, signed by the treasurer, shall have been sent by mail to the last known residence or place of business. ness of the member in whose name such cer-tificate shall stand on the books of the exchange, he shall cease to be a member.

ARTICLE VIII. MISCELLANEOUS

Sec. 1.-The exchange shall be open for business daily, except Sundays and legal holidays, during such hours and under such rules as the board of managers may estab-lish; but the exchange may be closed at any time whenever the board shall deem it ex-

Sec. 2.-Notices of meetings of the exthe bulletin beards, and no notices shall be posted except such as relate to the affairs of states. New York, Virginia, Georgia, in the instrument last mentioned State in the three three interests, and in the bulletin beards of all other matters intended by States. The maximum production in last-mentioned State it has decreased. The to consist of seamen from naval schools. In the instrument last mentioned State in the two consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the instrument last mentioned State is how at the consist of seamen from naval schools. In the consist of seamen from naval sc

the exchange, unless by consent of the floor

Sec. 3.-No persons, except members and their temporary representatives, as provided for in Article I, Section 4, shall be admitted to the floor for purposes of business. Members, however, may introduce their friends as visitors, by entering their respective names in a book to be kept for their transportations. for that purpose, and may obtain for such visitors a card of admission for seven consecutive days in each current year. This privilege shall not be extended, except with consent of the Floor Committee; and should any person so introduced violate the rules of the exchange by the transaction of business. the member introducing such person shall lecome liable to pay a fine, at the discretion of the board of managers, and be subject to Sec. 6.—The Warehouse Committee shall the same penalty for non-payment as pro-examine into and pass upon all applica-tions for licenses as warehousemen, weighers, VII of the by-laws.

Sec. 4.—All rules adopted by the board of managers shall, after having been posted on the bulletin of the exchange 10 days, be in force and binding on the members; and the rules in force shall govern all cases to which they may be applicable, provided they do not conflict with any provisions of a contract

> ARTICLE IX. AMENDMENT OF BY-LAWS.

These by-laws may be altered or amended a majority vote of members at a meeting called for that purpose, of which 10 days notice shall have been given, stating specific ally the alteration or amendment proposed.

British Open-Hearth Steel in 1882.

From the annual report of the British Iron Trade Association, it appears that at the end of 1882 five works were either erecting or about to erect eleven open-hearth furnaces, which will bring up the total number of works in 1882 to 46, and the total number of furnaces to 179, equal to a production of 720,000 tons of open-hearth steel per annum. The chief manufacture from open-hearth steel in 1882 was that of ship-plates and angles, in addition to which, however, about 50,000 tons of rails were produced. The remainder, consisting of over 200,000 tons, has been applied to the manufacture of forgings, castings, wire, axles, wheels and a multi-plicity of other articles. Investigation shows that the production of open-hearth steel in Germany in 1881 was 124,700 tons, from 28 furnaces in operation. Of the manufacture of open-hearth steel in France, Russia and the control of the same produced with the different fuels in the same period shows as follows: Austria no separate statistics are kept, but the capacity of production possessed by the existing plant in these and other countries in 1882 Was

NUMBER AND CAPACITY OF PRODUCTION OF SIEMENS

Country. Number	r. Capacity
Great Britain 163	684,000
United States 44	170,000
Russia 30	120,000
Jermany 47	184,000
France 47	198,000
Austria	60,000
Sweden 6	94,000
Finland 3	8,000
Total 354	1, 442,000

The output of open-hearth furnaces has varied considerably, according to their capacity and the character of the practice adopted in working them. Assuming, how-ever, an average of 4000 tons per furnace per annum, the existing open-hearth plant in Great Britain is equal to an annual producit shall require the affirmative vote of three-fourths of the members of the board present Great Britain is equal to an annual produc-and voting at the meeting at which the tion of 652,000 tons, or 216,000 tons more

Charcoal Pig Iron in 1882.

The annual statistical report for 1882 of Mr. James M. Swank, some extracts from which, from advance sheets, we gave in our issue for April 26, furnishes a good illustrastanding or special committee shall constitute a quorum for the transaction of business, and a majority decision of such quorum shall be valid. Vacancies that may occur in any of the committees shall be filled in the same manner in which such committee was originally appointed or chosen.

Sec. 12.—Special committees, and all committees required by the rules and regulations made by the board for the government of the trades carried on by members of the exchange, shall be appointed by the president, subject to the approval of the board, unless directed to be chosen by ballot, and shall consist of such number as may be ordered at the time of their appointment, or

Kinds of fuel. Anthracite Charcoal Bituminous	537,558	1881. 1,734.462 6:8,838 2,968.264	1882. 2,043,138 697,906 8,438,078
Total	4,295,414	4,641,464	5,178,122
The production	n of 1882	exceeded	that of

any previous year in every respect. More bituminous pig iron, more anthracite pig iron and more charcoal pig iron were made than was ever produced in any one year before. The stock of unsold pig iron in makers' hands at the close of 1882 was more than twice as large as that at the close of 1881. The stock at both periods is shown in

the following table, in net tons: Kinds of fuel. 1882 Anthracite.....

Total..... 429 694 210,896 The stock of both bituminous and anthracite pig iron on hand at the close of 1882 is thus seen to have been light, but that of char-coal pig iron was very heavy, amounting to almost one-fourth of the production for the almost one-fourth of the production for the year of that kind of iron. As our imports of foreign pig iron in 1882 amount to about 540,000 gross tons, and the producers of pig iron had 188,300 gross tons on hand unsold at the beginning of 1882, as compared with 383,655 tons at the close of the year, our 383,655 tons at the close of the year, our probable consumption of pig iron in 1882 was about 4,967,968 gross tons, against a probable consumption of 4,982,565 in 1881.

The subjoined table exhibits the produc-

tion of charcoal pig iron from 1872 to 1882

Alabama, Michigan, Wisconsin, Missouri, iron-producing States. No charcoal pig Minnesota and Oregon—9 in all. In the year 1881, 13 States made their maximum

There is much in this table worthy of study. product :

by the producer of charcoal pig iron. The

PRODUCTION OF CHARCOAL PIG IRON FROM 1872 to 1882, BY STATES.-Tons of 2000 Pounds.

States.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.
Maine		780	r,661	2,046	3,001	1,060	1,100	1.24	3,578	4,400	4.10
Vermont			3,450	2,400	550	SIO	584	62		2,796	
Massachusetts	12,830	85,70					1,126				
Connecticut	33,700	26,977	14.518		10,100	14.443					
New York	10.812	39,320				16,563					
ennsylvania	45,033										
Maryland	39,044							19,73			
/irginia	21,445						6,333	7,703			20,27
North Carolina .	1,073			Hon	400		4333			19,030	
eorgia	2,045										1,15
labama	12,512			25.108	23,317						14,56
OWOR							23,993	31,991		44,231	
Vest Virginia	org							400		3,000	1,32
Centucky	950							200		1,200	*****
ennessee							16,928	13,736		16,778	17,16
blo	34,094	34.53?	37,227		10,068	11,208	11,227	7,467		19,046	37.61
hio ndiana	95,622	100,498			48,931	42,117	33,513	43-445		66,169	48,65
uuiana	**** ****		2,100			1,250			2,000	********	
lichigan		113,975	128,969	101,805	82,477	75,216	70,853	101,539	154.424	187,043	2 0,19
Visconsin	27,790	98,880	28,973	26,483	26,261	22,205	27.487	31,430	42,913	47,703	55, 161
lissouri	45,489	39.536	49,093	39,785	24,113	28.46c	16,861	17,837	15,769	43,241	54.32
regon			2,500	1,000	1,750		1,310	2,500	5,000	6,100	6,750
linnesota										7,442	8,120
tan			200	150	64					7144	
alifornia		********	*******	*******						4,414	98
Vash. Ter		*******	*****	*******					*******	1,200	
Total	500,587	577,620	576,557	410,990	308,649	317,843	293,399	358.873	537.558	638,838	697,900

					1	1	1						1 6
	Anthracite coal.			1,202,144				,092,870	1,273.024	1,807,651	1,734,462	2,042.138	8
1	Charcoal Bit. ccal & coke.	984,159	577,620 977,904				317,643 1,061,945 I	203 300	348,873	\$37.558	628,828	607,006	
			ARREST THE PARTY NAMED IN	MARKET AND ADDRESS.	-	mark from the same	CONTRACTOR OF THE PERSON NAMED IN	and the same of					1.8
	Total	2,854,558	2,865,278	2,689,413	2,266,581	2,093,236	2,314,585 2,	,577,361	3,070,875	4,295,414	4.641,564	5,178,122	0

The condition of the furnaces of the United States which have been looked upon as the tates on January 1 of the present year is homes of the charcoal-iron industry are States on January I of the present year is shown in the following table, as compared with their condition one year previous :

Completed furnaces. In blast. Out of blast. January 1, 1883...... 687 January 1, 1882...........701 270 255 From the above we see that the increase of production with the various fuels is as fol-Net tons. Per cent

. 169,814 . 307,076 . 59,068 7% 17. 9%536,558 The rapid improvement in the charcoal pig-iron industry in four years past is shown

Net tons. 81

The percentage of increase in the quantity

Fuel.	1879 over 1878.	1880 Over 1879.		1882 over 1881.	1882 over 1878.
Anthracite coal	16.5	41.9	*4.0	17.7	87
Bituminous coal	20.8	35.52	16.3	7.5	105
Charcoal	22.3	49.79	18.8	9.25	138

* Decrease

The enlargement of the output of charcoal iron is not due to an increase of the number of blast furnaces, but to an augmented product per furnace.

Charcoal furnaces.

					1
Number.	States	Total furnaces.	Out of blast Dec. 31, 1882.	In blast Dec. 31, 1882,	Net tons made 1882.
E	Michigan *	28	T4	14	210,195
2	Ohio	31	12	19	58,654
3	Alabama	10	2	8	55,541
4	Wisconsin . p	13	5	7	55,369
5	Missouri	9	7	2	54.327
5	Pennsylvania	37	12	25	49-975
7	Tennessee	13	5	7	37,611
8	New York	16	10	6	30,716
9	Maryland	16	9	7	28,277
0	Virginia	29	17	2.8	26.133
1	Connecticut *	9	2	7	24,342
2	Kentucky	15	9	6	17,165
3	Georgia	3	3	3	15,505
4	Massashusetts	4	2	2	10,335
5	Minnesota *	3.		3.	8,126
6	Oregon *	X		I	6,750
7	Maine *	- 1		X	4,100
8	Texas *	X		1	1,321
9	Vermont *	I	I		1,210
0	North Carolina *	5	5		1,150
E	California*	1	- 1		987
12	Utah *	1	1		57
	Total				697,906

The States marked * made charcoal iron only.

The only States which increased the num-But there are to-day fewer charcoal blast year ago, and yet the production of pig iron in 1882 exceeded that of 1881 by 59,068 tons. Michigan shows the largest increase in pro-Michigan shows the largest increase in production, having gained 23,152 tons, and it maintains its place at the head of charcoal iron producing States, where it has stood since 1873. Ohio has ranked second in order since it gave up its position of pre-eminence to Michigan, and still occupies that rank, closely pressed, however, by Alabama, Wisconsin and Missouri. Although second in order, Ohio produced in 1882 but 28 per cent. of the amount of pig iron made by Michigan in 1882, and but 58 per cent. of its own output of 1873. Ohio and Pennsylvania both made less charcoal pig iron in 1882 than in 1881, and the former State has fallen back from third place to sixth in order of production. In one year Alabama augmented its pig-iron product 25 per cent, and rose from the fifth to the third place. Wisconsin holds its former position, but with increased product. Missouri has, by enlarging its pigone number. Tennessee has in the year passed ahead of New York, Connecticut and Maryland. There has been a slight improvegiving place to newer aspirants. Pennsylvania, Ohio, Connecticut and Massachusetts all produced less charcoal pig iron than in 1881; but Michigan, Wisconsin, Alabama, Misconsin, Tonnecticut and Visikiri, Tonnecticut and Misconsin, Alabama, Missouri, Tennessee and Virginia have made material advancement. It is not alone the rich ores of the Northern lakes nor the wealth of timber in the Southern States which produce such results, but it is a more progressive management on the average, larger and more modern furnace plants, powerful machinery, efficient blast-heating apparatus, and greater economies in manufacturing and transporting charcoal, which combine to teach the lessons of the table. If it were in teach the lessons of the table. If it were in ore only, would Michigan, with 28 blast furnaces completed, have produced nearly four times the amount of charcoal pig iron that was made in Ohio with 31 stacks, or can the output of 55,369 tons from 10 furnaces in Alabama, when compared with 49,975 tons made in Pennsylvania with 37 furnaces, be credited to he timber supply only? Connecticut and Missouri sustain an equal number of charcoal blast furnaces, but in 1882 the former State produced but 45 per cent, as much as the latter.

As a rule, the States which have the most liberal wood supply employ the most economical methods of producing charcoal, while in those where the timber has been much cut off, the more wastful methods prevail. Similarly, where rich ores abound, the greater care is bestowed on preparing the supply for the furnace, but in localities where leaner ores are found they receive little, if any, ores are found they receive little, if any, preparatory treatment. A careful estimate places the consumption of wood to produce the 375,432 tons credited to Michigan, Alabama, Wisconsin, and Missouri at but 15 per cent. above what was required to make the 191,964 tons produced in New York, Connecticut, Pennsylvania, Maryland and Ohio.

In making these remarks, we do not forget that there are particular works in every State which do much toward maintaining its reputation, as well as others which, by their

reputation, as well as others which, by their small output or inferior management, materially reduce the average record, but a can-did survey of the charcoal iron producing industry of the United States demonstrates that it is not only location which has made possible the remarkable results now pub-lished. Twenty-seven States and Territories produced pig iron in 1882. Charcoal pig iron was made in 22 of these, and charcoal was the only fuel employed in smelting iron in 10 States and Territories. Anthracite pig iron was made in 5, and bituminous pig iron in 15 States. The following statement exhibits the production of charcoal pig iron in various districts, arranged to cover the same areas as in our statement for 1881,

Northern district, including the furnaces of Maine, Vermont and Northern New York; Salisbury district, embracing the furnaces in The only States which increased the number of active charcoal blast furnaces were Michigan and Maryland, while the number in working order reported has decreased in Ohio, Tennessee, Virginia, Kentucky and Georgia. Furnaces have been built and Georgia. Furnaces have been built and west Virginia; Southern district, empraising the furnaces in Maryland, Virginia and West Virginia; Southern district, empraces of Alabama, Georgia. others have been abandoned, which, in some cases, equalize the number in certain States.

Tennessee, North Carolina and part of Ken-Tennessee, North Carolina and part of Kentucky; Hanging Rock district of Ohio and furnaces in running order than there were a year ago, and yet the production of pig iron ing the furnaces using Lake Superior ores, including all in Michigan and Minnesota and part of those in Wisconsin and those of Northwestern Ohio (the furnaces omitted from Wisconsin quota are those using local ores); Western district, all charcoal furnaces

west of the Mississippi River.
According to this division, the amnexed statement, exhibiting the amount of pig iron made in each of the years 1880, 1881 and 1882, gives a general idea of their relative

importance, in net tons .		
1881.	1880.	1882
Northern District :6,924	14.651	16,58
Salisbury District 61 582	51,016	54,12
Pennsylvania District 51,908	43-374	49.97
Baltimore District 47,864	50,338	54,41
Southern District 82,060	66,179	116,04
Hanging Rock District 73.676	81,538	66,53
Lake Superior District 241,284	199,573	275.11
Western District 54,955	23,269	63.44

Colossal steamship enterprises are the

It is proposed to begin by dispatching a steamer with mails every fortnight from Barcelona, calling at Valencia, Malaga and Cadiz, for Mexico and the ports of the South American Republics, both on the Atlantic and on the Pacific. In consideration of carriage of the mails, and the right reserved to the Government of making use of the ves-sels for any purpose in case of an emergency, the company are to receive a yearly subvention of \$100,000. The 12 vessels are to be built abroad, and are all to be completed within two years. Another big job for the Clyde, undoubtedly.

The Mersey Tunnel.

Rapid progress is now being reported in onnection with the tunnel of the Mersey Railway, England, and nearly 700 men are said to be employed both night and day working in eight-hour shifts. The tunnel will be 3½ miles in length. The drainage headings are about 100 yards in advance of the main headings, and will act as reservoirs, into which the water from the main tunnel will be drained and run off to both sides of the Mersey where purpose of great rower. the Mersey, where pumps of great power will raise the water to the surface. The excavations of these drainage headings extend at the present time about 100 yards beyond the main tunnel works at each side of the river. The drainage shafts are sunk to a depth of 180 feet, and are below the lowest point of the tunnel which is drained into them. Each drainage shaft is supplied with two pumping sets, consisting of four pumps, two of 20 inches diameter and two of 30 inches diameter, capable of discharging 6100 gallons per minute from the Liverpool shaft, and 5040 gallons from the Birkenhead shaft. These pumps will be required for the permanent draining of the tunnel. The levels give a minimum thickness of 25 feet and an average thickness of 30 feet above the crown of the tunnel. The depth of the water in one part of the river was found to be about 72 feet; in the middle about 90 feet, and as there is an intermediate depth of rock of about 27 feet, the distance from the surface at low water to the top of the tunnel is up-ward of 100 feet. One of Beaumont's well-known boring machines has been brought into requisition and is expected to carry on the work at the rate of 50 yards per week.

The depth of the pumping shaft is 170 feet, and communicates directly with the drainage headings. The main tunnel, which is 26 feet wide and 21 feet high, has also made considerable progress at both ends. From the Liverpool side it now extends more than 430 yards, and from the opposite side 590 yards, this distance including the underground stations, each of which is 400 feet long, 51 feet wide and 32 feet high. The tunnel is lined with brickwork, some of which is 18 inches thick, composed of two layers of blue and two of red brick. Toward the river this brickwork is increased to a the river this brickwork is increased to a thickness of six rings of bricks, three of blue and three of red. The tunnel arch has a radius of 13 feet, the side walls one of 25 feet and the invert one of 40.

A Novelty in Marine Architecture .-A steamer of peculiar rig is now lying at the foot of West Thirteenth street, New York. It is named Jesse H. Freeman, and is owned by the Standard Steam Navigation Co., of Boston. She is a wooden vessel, built at Bath, Me., 153 feet in length, 30 feet beam and 17 feet depth of hold. The Messrs. Delamater put in her engines (auxiliary) of 300 horse-power. The cylinders are 24 x 36 inches, and her screw has two blades and makes 140 revolutions a minute. She has three masts, rigged fore and aft as a schooner. Her mizzenmast, which is 85 feet high, is of iron, and serves also as a smoke-stack. The Jesse H Freeman is the first of a fleet of like vessels that the Standard Steam Navigation Co. propose to build. The company, which was organized May 3, 1883, is composed of Capt. Jesse H. Freeman, president; J. F. Crocker, treasurer; Lamont G. Burnham, A. S. Messer, Thomas M. Hart and Thomas B. Griffiths, directors. The company tested with a pada un capital of \$60.0000 and started with a paid-up capital of \$50,000, and the steamers built for them will be used in the fruit trade. The Jesse H. Freeman has already been chartered by Severns & Co., of Boston, and she will run between Boston and Port Antonio, Jamaica. She will have a crew of 11 men, commanded by Capt. William Anderson, her chief engineer being John Doyle. The propeller is so arranged that when they are the commanded that when they are the commanded the commanded the commander of th that when stopped it will assume a perpendicular position, and offer no resistance when the vessel is under sail. On the main deck is a donkey engine, which will, by the aid of messenger chains, raise the anchor, hoist and ower the sails and work a steam-pump. er trial trip she reached a speed of 12 knots an hour, though on ordinary occasions she will be required to make but eight. Her round trip will consume 20 days, which will include an allowance of four days for loading.

The Opening of the Bridge.-According to a notice recently issued by Vice-President Kingsley, passes will no longer be issued, nor will they be sent in response to written applications, as already such letters numbered 300 a day. The passes already issued will be honored on presentation. In regard to the date set for the bridge opening (May 24) being the birthday of Queen Victoria, Mr. Kingsley, who is one of the committee on the opening, said that when the date was selected none of the committee, in his opinion, knew that it was the Queen's birthday. The date was selected because the contracts would all be filled at that day and opening the structure would not inter-fere with the work in any way. The date had now been settled and it would be diffiorder of the day, and even Spain, commercially decrepit as she is, is not behind in the race. Thus, a committee of Barcelona shipowners, with a capital of \$10,000,000, to the Mayors of the two cities by the Maryland. There has been a slight improvement in the output by New York and Maryland, but Connecticut falls behind three numbers. Virginia, although advancing but one in rank, increased her pig-iron product 37 per cent. Kentucky, Georgia and Massation of the vessels being rapidly converted into war ships if desired. They are to be in charge of officers of the Royal Navy, and two-thirds of the crews are ter, which every one would be welcome to have just offered to construct 12 steel-built trustees. After the Mayors' acceptance of vessels of 4000 tons each, to run 17 miles it, addresses will be made by William M.

Special Notices.

Bargains.

Bargains.

NEW BOILERS.

Three to Sixty Horse-Power.

ENGINES,

Three to Forty Horse-Power.

LOVEGROVE & CO.,

152 N. Third Street,

PHILADELPHIA, PA. For Sale.

Stock of General Hardware, Stoves and Tinware, and good-will of the business without bonus. Stock will inventory tairteen to fifteen thousand. Business located in a growing town of about ooc inhabitants, in Northwestern Pennsylvania, and a railroad center. For further information, address Office of The Iron Age, 83 Reade St., New York.

For Sale.

CARPET STRETCHER PATENT. Will sell on sight.

A. G. BROOKS,

acr N. Third St., Philadelphia. FOR SALE.

No. 6 Baker Blower, Nos. 4 and 6 Sturtevant Blower, No. 6 McKinzie Blower, and Alden Blower, Outlet 7 x 6½; Cupola, 46 inches; Crane, 15 tons; 2, 4, 6 and 10 H. P. Baxter Engines; 9 x 12 Horosontal (new) do.; Planer, 20 x 16 x 4; Buzz, do.; Emery Grinder, 1½ mandrel, 2c. C. R. BIGELOW, 18 New Church St., New York City, Agent for Lehigh Valley Emery wheel Co.'s Wheels and Machinery.

CROP ENDS OF 1% x No. 16 AND 1% x No. 17 HOOPS FROM TWO TO FIVE FEET LONG, IN

For Sale by

A. R. WHITNEY & CO.,

58 Hudson St., New York. WANTED.—A permanent position as Manager,
Superintendent or Designer and Drafteman by an energetic man who knows his business
and scientificatily educated, with long, practical
experience in originating all kinds of new machinery, both light and heavy, and boilers, estimating
their cost and price, and superintending their construction, and the management of help.

Address

6 East Eighth St., Oswego, N. Y.

A FIRST-CLASS Civil and Mechanical Engineer, one thoroughly experienced in the erection and management of Gas Works, desires an engagement. BOX 2847, Post Office, Boston, Mass.

FOR SALE OR RENT. FOR SALE OR RENT.

To Manufacturers: I have one of the finest manufactories in the West, with a capacity of so, co square feet of floor space, equipped with gas, hydrant water, no-horse-power engine, two boiters, elevators, benches, shafting, &c., as Grand Crossing, just outside the city limits of Chicago. Over no passenger trains a day between Chicago and Grand Crossing. For further particulars, apply to W. & WILSON.

255 and 257 Wabash Ave., Chicago, Ill.

Wanted.

A partner who has had experience in Hardware and will connect with a Stove, Tin and Slate Roofing business in Central Ohio. Population, Soco. A good chance for the right man. Nothing but first-class goods in stock. "T. PEEBLES," Office of The Iron Age, 33 Reade st., New York.

Steam Yacht.

FOR SALE FOR WANT OF USE. 33 ft. long , 7 ft. beam , 4 ft depth of hold , Custom House Register, Engine 6 ft. x 6 ft., Boiler about 10 H. P., Pump and Heater, and Injector. A. G. BROOKS & WINEBRENER, 261 N. Third St., Philadelphia

To Exchange.

A party owning the machinery complete of a PLATE AND SHEET MILL,

ll exchange the same for improved or unim-oved property desirably situated, at fair cash lue. Machinery cost \$100,000 : all in good order. idress McKILLIP, 130 Dearborn St., Chicago, Ill.

Wanted.

An experienced man to sell Saws through Michgan and Wisconsin. Reference required.

Address MICHIGAN SAW & FILE WORKS,

Wanted \$25,000

Additional capital in Iron business we'l established near New York City. Ample security. Best reference given and required COMSTOCK,

Address Office of The Iron Age, 83 Reade st., New York

PARTNERSHIP WANTED.

A gentleman with \$1000 would like to buy an interest in some established Hardware and Stove business on or near the coast; has been in the business before; is a practical tinner, in years' experience; will take the active management of the business, attending to the shop and job work; highest recommendations.

Address

Address

A. H. LOVEJOY,
Care SARGENT & CO., 17 Chambers St., N. Y. City.

A N experienced built Manager is open for an engagement. Has had considerable experience in designing and erecting mills, and is practical in all desails, from puddings to guide rolling. Could influence considerable trade in certain sections. Best reference as to character and capacity. Address. S. L. N., Office of The Iron Age, 220 S. 4th St., Phila., Pa.

Office of The Irvs Ayr.

No SHEET 160 * MANUFACTURE 168.—A gentleman of experience in the above business would be glad to negotiate with a view to an apcointment as Manager or Assistant Manager. Solid experience, both practical and commercial, in a Welsh : heet Irvn and Tur Piate Works. Address WALES.

Office of The Irvn Age, 83 Reade St., New York.

AN OFFICE (10 x 18) TO RENT,

On ground floor of No. 298 Broadway, suitable for a manufacturer or buyer of Hardware. Apply on the premises.

Special Notices.

SECOND-HAND AND NEW

MACHINERY.

One Corlias Beam Condensing Engine, 30 in. x 72 in.
One Horizontal Corlias Engine, 40 in. x 42 in.
One Horizontal Corlias Engine, 40 in. x 42 in.
One Horizontal Corlias Engine, 42 in. x 39 in.
One Horizontal Corlias Engine, 42 in. x 39 in.
One Horizontal Engine, 52 in. x 42 in.
One Horizontal Engine, 52 in. x 42 in.
One Horizontal Engine, 52 in. x 45 in.
One Horizontal Engine, 52 in. x 10 in.
One Horizontal Engine, 63 in. x 10 in.
One Hor. Tub. Boller, 36 ft. x 13 ft.
One Hor. Tub. Boller, 36 ft. x 13 ft.
One Hor. Tub. Boller, 36 ft. x 13 ft.
One Lor. Tub. Boller, 36 ft. x 13 ft.
One Lore Horizontal Engine, 63 in. x 12 in.
One Engine Lathe, 12 in. x 8 ft.
One Engine Lathe, 12 in. x 15 ft.
One Engine Lathe, 12 in. x 15 ft.
One Engine Lathe, 13 in. x 5 ft.
One Engine Lathe, 14 in. x 6 ft.
One Engine Lathe, 15 in. x 6 ft.
One Engine Lathe, 14 in. x 6 ft.
One Engine Lathe, 24 in. x 17 ft.
One Engine Lathe, 24 in. x 17 ft.
One Planer, 36 in. x 6 ft.
One Planer, 36 in. x 6 ft.
One Planer, 36 in. x 6 ft.
One One Planer, 36 in. x 6 ft.
One One Planer, 36 in. x 6 ft.
One Engine Lathe, 24 in. x 17 ft.
One Planer, 30 in. x 6 ft.
One Engine Lathe, 25 in. x 16 ft.
One Engine Lathe, 26 in. x 6 ft.
One Planer, 36 in. x 6 ft.
One Engine Lathe, 37 in. x 6 ft.
One Planer, 38 in. x 6 ft.
One Engine Lathe, 38 in. x 6 ft.
One Planer, 30 in. x 6 ft.
One Engine Lathe, 30 in. x 6 ft.
One Planer, 30 in. x 6 ft.
One Engine Lathe, 30 in. April 12.

J. Gray's Machinery Depot, 37 Dey St., N. Y.

For Sale.

New Machine Tools, &c. E. P. BULLARD, 14 Dey St., New York.

compound rest. 24 in. \bar{x} 12 ft. Engine Lathe, power cross feed and compound rest. 26 ip. \bar{x} 16 ft. Engine Lathe, power cross feed and

AMERICAN TOOL CO., Cleveland, Ohio.

SPECIAL NOTICE. IN PRINT AND READY FOR DISTRIBUTION IN 30 DAYS. A POCKET MANUAL FOR ENGINEERS, EDITED BY

JOHN W. HILL, Mechanical Engineer, Member American Society of Civil Engineers; Member American Association R. R. M. M. EDITION TEN THOUSAND.

EDITION TEN THOUSAND.

Of which, first 2800 copies will be furnished, pastage prepaid, at one dollar (\$1.00) each; subsequent copies will be furnished (postage prepaid) at one dollar and a haif (\$1.50) each. A pocket manual of useful information for mechanical engineers, steam users and mechanics, containing 22 pages (set in nonparied type) of carefully selected data, formulæ and experimental investigations from the latest and most approved sources. Printed from electrotype place, on white No. 1 book paper, in stiff morocoo covers with cardinal edges. Size of page 49 x 69 inches. From press of Robert Clarke & Co., Cincianati, O. Published by WILLIAM A. HARRIS, Builder of Harris-Corliss Steam Engines. Providence, R. I., to whom all subscriptions for copies should be sent.

Wanted.

Light Machinery of all Kinds to Build.

Also Experimental, Jobbing and Repair Work.

Would also contract for rolling from 100 to 500 tons special shapes or sizes of iron.

Correspondence solicited.

GLOBE NAIL CO.,

Notice of Dissolution. NOTICE is hereby given that the firm of Charles & Capacity 30,000 tons per annum. Craig, hardware dealers at Hornellaville, N. Y.,

g, hardware dealers at Hornellaville, N. Y., y dissolved by mutual consent. All claims ing against said firm and all claims due said be settled by the undersigned, Edward R. lowill continue the bardware business at besetsfores occurred by said firm. Dated, April 14th, 1883.

Wanted.

To Sell or Let, a first class Foundry, situated in the village of Green Island, N. Y., on the opposite side of Hudson River from Troy; within easy reach of Hudson River and Erie and Champlain Canals. Goods can be shipped as late as 6 p. m. and be in New York early next mornise. To manufacturers of Hardware specialties it offers exceptionally fine advantages. Has a good engine and all necessary machinery in the buildengine and all necessary
engine and all necessary
ings.
Correspondence solicited. Address
JAMES MORRISON.
4Troy, N. Y.

Bargains.

Two 24 in x oft. Engine Lathes, One 24 in. x 12 ft. Engine Lathe, Two 36 in. x 36 in. x 8 ft. Planers, Two 36 in. x 36 in. x 10 ft. Planers, Two 36 in. x 36 in. x 12 ft. Planers, One 50 in. x 50 in. x 14 ft. Planer.

One 50 in. x 50 in. x 14 it. Final Write for price 8. H. GRAVES LOUDEN, 22d and Washington Ave., Philadel A Young Man,

wide-awake and a worker, with \$4000 and 15 vears' experience in Hardware business, desires an interest with some good firm between this and July 1st. References At.

H. W. BECK, 65 Wood Street, Pittsburgh, Pa.

To Brass Foundries. To Brass Manufacturers.

Our new foot press, for cutting off GATES from brass castings by FOOT power, is now ready. Weight, 256 ba. Price complete. \$50. net. A buy can operate it easily, we warrant them to give the most perfect it easily. We warrant them to give the most perfect, actisfaction. PREMILESS PREMI CO. BRIGHT Office of The Iron Age, 83 Reade St., New York.

W. Ney Street, New York.

Special Notices.

New and second-hand Iron Working New and Second Hand Machinery.

MACHINERY.

Two Engine Lathes, 42 in. x 16 ft. Triple Geared.
Ames. New. August.
One Engine Lathe, 56 in. x 18 ft. Fifield. New. Aug. 1.
One Engine Lathe, 29 in. x 18 ft. Ames. New.
One Engine Lathe, 29 in. x 18 ft. Ames. New.
One Engine Lathe, 24 in. x 10 x 12 ft. Fifield.
One Engine Lathe, 22 in. x 10 x 12 ft. Fifield.
One Engine Lathe, 10 in. x 10 ft. Ames. New.
One Engine Lathe, 10 in. x 10 ft. Ames. New.
One Engine Lathe, 10 in. x 10 ft. Ames. New.
One Engine Lathe, 10 in. x 10 ft. Ames. New.
Six Engine Lathes, 10 in. x 8 ft. Ames. New.
Six Engine Lathes, 13 in. x 8 ft. Ames. New.
Six Engine Lathes, 13 in. x 6 ft. Ames. New.
Six Engine Lathes, 13 in. x 5 ft. Ames. New.
Six Engine Lathes, 13 in. x 5 ft. Ames. New.
One Chucking Lathe, 20 in. x 5 ft. New.
One Chucking Lathe, 20 in. x 5 ft. New.
One Planer, 16 in. x 2 ft. Bridgenort. New.
One Planer, 16 in. x 2 ft. Bridgenort. New.
One Planer, 20 in. x 5 ft. Phoenix. Al.
One Planer, 20 in. x 5 ft. Phoenix. Al.
One Planer, 21 in. x 6 ft., 7 ft. and 8 ft. Ames. New.
One Planer, 21 in. x 6 ft., 7 ft. and 8 ft. Ames. New.
One 1 in. Stroke Shaper. Boynton. New.
One 1 in. Stroke Shaper. Boynton. New.
One 1 in. Stroke Shaper. Hendey. New.
One 24 in. Stroke Shaper. Hendey. New.
One 24 in. Stroke Shaper. Hendey. New.
One Screw Machine. No. 2. P. & W. Al.
One Screw Machine. No. 2. Pratt & Whitney.
One 6 in. Upright Drill. Prentice. New.
Two 20 in. Upright Drills. No. 2. Fratt & Whitney.
One 6 in. Upright Drills. No. 2. Fratt & Whitney.
One 6 in. Upright Drills. No. 3. Pratt & Whitney.
One 6 in. Upright Drills. No. 4. Prantice. New.
One 6 in. Upright Drills. Prentice. New.
One 20 lb. bradley Hammer. Hotchkiss. Good order.
One 20 lb. bradley Hammer. Al.
All sizes Bradley Hammers furnished to order promptly. New York Agency Brown & Sharp

Co.'s Machinery.

GENERAL SASTERS AGENT POR

Akron Iron Co.'s Patent Hot Polished Shafting. FIRST-CLASS PAYING BUSINESS For Sale.

Parties having built up and thoroughly established an extensive and fine paying business, will sell the rame, including several fine machinery specialities in iron and wood, and a jobbing business of every class of dearing. Shafting, &c., and Foundry and Woodwork. Specialities have but little competition and are easily managed. The jobbing business includes a very fine coll-ction of patterns in constant use, and controlling a very large jobbing trade. Also Machinery, Tools, Stock, &c., and good will.

Above business is constantly growing, and has every year cleared a very large smount of money. Is centrally located and upon a large and never-failing water power, with canal through premises and excellent railroad facilities. The reason for owners offering same is because the business has grown too large for present buildings and facilities and is contantly growing, and they desire to remove one specialty, for which they have lately secured letters patent and requiring special buildings and machinery, to the center of its market in the West, which will relieve sufficiently the pre-ent facilities now overcrowded. Or should any parties desire, we will sell the specialty and retain the other business.

The straightforwardness of above facts can be readily ascertained.

Any young man or old business men having money will find eitherbusiness a very pleasant and profitable one. To save annoyance or trouble, we will an awer inquiries only from parties with commercial standing or who are vouched for by bankers or other responsible parties. Would prefer parties with means, interested and looking for an established, paying business, to call personally upon us with proper letters and introductions.

E. W. ROSS & CO.,
Fulton, N.Y.

SPANG STEEL & IRQN CO.,

LIMITED.

Open-Hearth Steel

in shapes of Blooms, Billets, Slabs, Universal Mill Plates, Angles and Shapes, Sheared Plates up to 100 inches wide, Machinery Steel, Spring Steel, Polished Steel Shafting.

Quality Guaranteed.

We offer the above as exclusive sales agents for the Middle States and Atlantic Coast, and solicit correspondence.

J. W. HOFFMAN & CO,

208 South Fourth Street,

PHILADELPHIA.

For Sale.

We have for sale at our works one Thirty-ton Standard Gauge Locomotive, lately rebuilt, and now in good running order. Size of cylinders, 145 in x 2s in. Cost originally \$13,000. Will sell it for \$4000. Delivered on track at Union Depot, this city. Address. this city. Address
POPE IRON AND METAL CO.,
St. Louis, Mo.

Wanted.

A full set of medium weight hollow-ware pat-terns. Address, with price and number of each kind patterns. KEARNEY & CO., Raleigh, N. C. SITUATION WANTED.

By a man of 40, as Salesman, Buyer or Superintendent; 20 years' experience in Hardware and Iron. Address RALPH. 25 Ferry Street, New York.

BOX 480, Columbia, Lancaster Co., Pa. WANTED.—An energetic young man as cierk and salesman in a waolesale bardware store. One who has had experience in the retail trade preferred. Address, stating age, experience, expectations, &c.,

Office of The Iron Age, 83 Reade St., New York

Special Notices.

Engine Lathe, 42 in. swing, 20 ft. bed. New.

1 each Engine Lathes, 36 in. swing, 20 ft. and 16 ft. bed. New.

2 Engine Lathe, 10 in. swing, 18 ft. bed. 2d hand. each Engine Lathes 26 in. swing, 10 ft., 12 ft., 14 ft., 16 ft., 20 ft., 24 ft. bed. New.

2 Engine Lathe, 24 in. swing, 8 ft. bed. 2d hand.

2 each Engine Lathes, 21 in. swing, 6 ft., 8 ft., 10 ft., 12 ft. bed. New.

2 each Engine Lathes, 20 in. swing, 6 ft., 8 ft., 10 ft., 12 ft. bed. New.

2 Engine Lathes, 20 in. swing, 8 ft. bed. 2d hand. 1 each Engine Lathes, 20 in. swing, 6 ft., 8 ft., 10 ft., bed. New.

Engine Lathes, 10 in. swing, 7 ft., 8 ft., 10 ft., bed. New.

Shaping Machine, 12-in. stroke, 18-in. traverse. New.
2 Shaping Machines, 17-in. stroke, 2d hand,
1 Index Milling Machine, 2d hand,
2 Back-geared Milling Machine. New.
1 Milling Machine, New.
1 Hand Milling Machine. New.
2 Automatic Milling Machine, New.
3 24-inch Upright Drills, Bk. Gr. and Self Feed.
New.
1 22-inch Upright Drill, Wheel Feed. New.
1 22-inch Upright Drill, Wheel Feed. New.
1 23-inch Upright Drill, Wheel Feed. New.
1 25-inch Upright Drill New.

so-inch sensitive Drill. New. Second-hand.

4-Spindle Drill Press. New Single Spindle Light Drill, Table Feed. New, Single Spindle Profiler. New, Two Light. New. Screw Machine, New.

Slotter, Cutter Grinder, Tapping Muchin 13 ft. Bending R Tapping Muchines, 13 ft. Bending Rolls, 2d hand. 40 in. Car Wheel Borer, 2d hand. Wood-Working Machinery.

Double Saw Bench. New. Variety Turning Lathe. New. 24-in. Surface Rotary Brd. New. Band Sawing Machine. New. Scroll Band Sawing
Scroll "
Rod Machine. Self Feed. "
Sandpapering Machine. 2d hand.
5-in. Moider, 4 sides. 2d hand.
Edge Moiding Machine. 2d hand.
Daniels Planer. 3d hand.
And lot of others, both new and 2d hand.
Write for what you want.

J. M. BADGER & CO., 49 DEY STREET, New York City.

For Sale.

Heavy Planer, 39 in. x 39 in. x 13 ft., with rack excension, to plane so ft. Good as new.
24 in. to 36 in. planers.
15 in. column drills.
1 in. to 36 in. lathes.
Lever Shears to cut 2 x 2.
Lever Shears to trim 14 plate.
A. G. BROOKS & WINEBRENER.
261 N. 3d St., Philadelphia.

For Sale.

Large Steam Engine, 28-inch stroke, 14-foot balance wheel. Little used, but idle some time, Few parts to be replaced. Price, \$4.00. Also Loco-motive Boiler, \$125. ADVERTISER, 2016 K Street, N. W., Washington, D. C.

For Sale.

A valuable Foundry and Machine Works, located in Frederick City, Md. Buildings new, built of brick, and substantial; covered with slate; capac-ity ample to work 1;5 men. Located near B. & O., and Pennsylvania railroads on about two scres of round.
Apply for chart, terms and information to
DUDLEY PAGE,
Frederick City, Md.

IRON AND STEEL.

Parties about opening House in Chicago for sale of Iron and Steel Products on commission desire correspondence with manufacturers in these lines wishing to introduce or extend sale of their specialties in the West.

Have valuable acquaintance of long standing ith Western trade, References unexceptionable.

"IRON AND STEEL," Office of The Iron Age, 36 and 38 Clark St., Chicago, Ill.

Two Good Hardware Men Wanted. Wanted, a Traveling Hardware Salesman, well

ecommended, to travel in the State of Michigan also a thorough Shelf Hardware man as salesman in the house. MORLEY BROTHERS. East Saginaw, Mich.

Notice.

The copartnership heretofore existing under the firm of Smith, Cohu & Co., is discontinued in consequence of the death of Henry S. Cohu.
All the outstanding business of the late firm will be settled at 70 and 8: Duane Street.
The undersigned will continue the business at their old stand, under the firm of Smith, Lyon & Co.

THOMAS T. SMITH.

JUDSON A. LYON,

GEORGE W. KINGSLEY,
WILLIAM T. SMITH.

NEW YORK, May 8, 1883.

Wanted.

LIVE AGENTS

to sell my Belt Protector and Belt Dressing in every large manufacturing center in the country. Liberal terms and large profits guaranteed. Address EDWARD S. LEWIS, 16 Herkimer Street, Albany, N. Y.

Special Notices.

New & Second-Hand Machinery.

H. PRENTISS & CO., 42 Dey St., N.Y

For Sale.

Established 1873. Gardner Bros "Standard Savage" Fire Brick Works, situated at Ellerslie Station, Md., on Baltimore and Ohio R. R. Also on Bedford Branch of P. R. R. Has convenient shipping arrangements on both roads. Works consist of two independent plants of machinery, so constructed and arranged that they can be run separately or together. One of the buildings entirely new, erected last year. Capacity of works, over 14,000 bricks per day. Mount Savage clay in abundance, mined on royalty, and delivered direct into works by gravity. Inclined plane and tram road, large portion of which was laid with new Tee rail last year. New artesian well, capacity over 35 barrels per hour. Also mountain stream, delivering water by gravity into tanks at works. Seven acree of land, with nine good tenements. Everything in first-class order for manufacturing and shipping brick direct from kilns into cars. Good and growing trade established. Brick unquestionably as good as the best made of Mount Savage clay. Statements of business done will be shown to responsible parties desirous of purchasing. Our good will and influence to go with sale. Any further information desired will be cheerfully given by

For Sale.

Established in 1864. Gardner Bros. Gas Retort and Fire Brick Works, situated at Lockport Station, on P. R. R., 60 miles from Pittsburgh, Pa. The works consist of complete plant for manufacturing Clay Gas Retorts, Settings, Blocks, Tile and Fire Brick. Capacity, about 100 retorts, with necessary settings, and 100,000 lire brick per month. Clay and coal mined by curselves within short distance of works and houled in wagons. Over three acres of land, with all necessary buildings, a number of tenements and town lots. P. R. R. has side track alongside our kilns. Good trade established. Our good will and influence to ge with sale. Statement of business done will be shown to responsible parties desirous of purchasing. Any further information desired will be cheerfully given by

GARDNER BROS.

Lockport Pa.

GARDNER BROS., Lockport, Pa. FOR SALE.

FOR SALE.

One Cast Iron Vacuum Pan. Vacuum and water pumps and all attachments.
One Granulator, with attachments.
One large Mirer, with attachments.
One large Mirer, with attachments.
Two Sug ir Packers.
Two Agitating Engines.
Two Steam Engines.
Two Scum Presses.
Two Scum Presses.
Two Scum Presses.
The above is a portion of the Machinery formerly used at Baltimore Steam Sugar Refinery, Baltimore, Md. For information apply to GEO.
B. GRAHAM, P. O. Box 193. Baltimore, Md., or to F. E. ADAM, n. e. cor. Lombard and Concord sts., Baltimore.

For Sale.

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns regarded as part of the property. Boiler Shop, Blacksmith Shep and Factory for the manufacture of heavy coal screens. Well located in the borough of Shamokin, Pa., with the best facilities for shipping oy rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. Easy terms of payment are offered to suit a purchaser of limited capital. For list of Tools and further particulars apply to WM. McLIVAIN & SONS.

Manufacturers of Boiler Plate and Tank Iron, Reading, Pa.

For Sale.

65 tons Charcoal Iron Blooms. 15 tons Boiler Fraces.
20 ton 5 Ship Knees.
60 tons Spikes, &c.
40 tons Spikes, &c.
40 tons Spikes, &c.
For particulars and price address
J. J. LiPPINCOTT & CO.,
131 South 4th st., Philadelphia, Pa.

36 Inch Lathe for Sale. A medium weight 36 in. x 12 ft. bed Lathe. Just built from new patterns.

GEO. A. OHL & CO., East Newark, N. J.

For Sale.

An old established Hardware and Tin Business in a growing town in Western New York. Stock in good condition and trade increasing. Address B. H., Office of The Iron Age, \$3 Reade st., New York.

DESIRING to engage in the exclusive jobbing trade in this city. I offer my retail stock for sale. Stock clean and in good shape. Location cest in the city. Purchaser can continue in present store.

A. C. FAUST.
Atchison, Kan.

A Partne Machine I Geulars, is

Apply

ST

A large and rang up to ve While ! for Miner or any or Call up

Purcha

CORRE

MAC

Special Notices.

CHAIN FOR SALE.

9-16 in., 13,000 pounds,

11., 30,000 pounds.

% in., 40,000 pounds.

34 in., 40,000 pounds.

r in., 3000 pounds. Stud Link,

114 in., 95,000 pounds. Stud Link.

176 in., 46,000 pounds. Stud Link,

2 in., 16,000 pounds. Stud Link,

sold low in lots to suit to close it out. The links One 25 H. P. Corliss Steam Engine

in the large sizes are larger than Lloyd's Standard, and will not fit American Patent Windlass.

C. W. & H. W. MIDDLETON,

945 Ridge Avenue,

PHILADELPHIA. Valuable Manufacturing Property At Auction.

If not sold privately, the undersigned will on 6th day of June, 1883, sell at auction at Baggs Hotel, Utica, N. Y.. at 2 p. m., the property formerly beonging to the Paris Furnace Company, located at Clayville, N. Y. This property consists of two separate mills or shops, one with steam and each with good water-power, full line shafting. &c. Attached to the works are shops, offices, residence and 24 acres of land. They are on the line of D., L. & W. R. R., 10 miles from Utica; were formerly used for the manufacture of Hoes, Forks, Scythes, &c., but can be readily adapted to any purpose. Taxation light; coal and labor secured at lowest rates.

The owners will let the property go at a great

The owners will let the property go at a great sacrifice, and to any one desirous of engaging in manufacturing no better location can be found. If not sold as an entirety the manufacturing establishments will be offered separately.

Terms, one-third cash; balance on bond and nortgage at five per cent., if desired. For particulars and description, address

H. C. SHOLES, Attorney-at-Law Clayville, N. Y.

For Sale or Lease.

A Large Two-Story Brick Factory,

formerly Macnine Works, at Pearl River, N. Y. formerly Macnine Works, at Pearl River, N. Y., on railroad depot, 25 miles from New York City, Railroad faculities unexceptionable, on the line of the New Jersev and New York Railroad. The property contains 40,000 square feet floor space, with one 85 H. P. Engine and Boiler, 700 ft. 2-mch line shafting and pulleys, main belts, steam heating and water pipes throughout the building. A splendid iron foundry, 70 ft. by 00 ft., with one iron smelting cupola with Mackenzie blower, brass furnace, core oven, blacksmith shop, pattern vaults, annealing oven, etc. The property can be bought or leased on liberal terms. For further particulars, price, terms, etc., address or Furl Liberty st., New York City, or Pearl River, Rockland Co., N. Y.

For Sale.

The largest stock of New and Second-hand Engines, Boilers, and general Machinery in the West. end for Catalogue. Hoisting Outfits for Coal Mining and other purposes a specialty.

WARREN SPRINGER, 195 to 219 South Canal St., Chicago.

For Sale.

Second-hand

DROPS and LIFTERS.

BEECHER & PECK, Lock Box 223, New Haven, Conn.

For Sale.

A lot of Wrought Iron Piles, 50 feet long, 6 inche in diameter. SITES & GILL, Apply.

> 222 and 224 South 3d st... Philadelphia, Pa.

STEAM PUMPS For Sale.

A large number of Steam Pumps of all makes, and ranging in size from small tank or boiler feeds up to very heavy service machines.
While the stock lasts good bargains are open for Miners, Water Works, Rolling Mills, Furnaces, or any one needing to move fluids by steam.
Call upon or address.
JNO. A. HINCKLEY,
Purchasing Agent of the United Pipe Lines,
Oit City, Pa.

Oil City, Pa

CORRESPONDENCE IS SOLICITED with parties having

MACHINERY TO BUILD.

Heavy work preferred.

THE HARTFORD ENGINEERING CO.,

Hartford, Conn.

Wanted.

A Partner with \$5000 to \$10,000 in a Foundry and Machine Business, established in 1824. For particulars, inquire of

L H. COLLER, Poughkeepsie, N. Y.

Wanted.

An old-established firm in Thames street, manufacturing specially one description of Ornamental Castings, but having warehouse too large for own use, are desirous to meet with manufacturers of other goods requiring them stocked in London and sold on commission. Apply to 203/30, care of frommonger Newspaper, 42 Cannon street, London, England.

Special Notices.

HENRY I. SNELL,

135 North Third St., Philadelphia, Pa., has just received a fresh lot of Machine Tools Engines, &c., which he offers at very low figures. One Screw-satting Engine Lathe, 6 ft. bed s8 in.

One florest carried Table, 5 ft. bed, 15 to. swing. One Screw-cutting Engine Lathe, 12 ft. bed, 18 in.

swing. One Screw-cutting Engine Lathe, 12 ft. bed, 24 in. swing.

One Iron Planer, planes 7 ft. lon ? 32 in. wide. One Power Crank Planer, 12 in. stroke. One 11 in. Shaping Machine, traveling head. One 38 in. Upright Drill. Extra heavy. New. The above is all new proof chain, and will be One 300 lb. Ferris & Miles Steam Hammer.

> One 40 H. P. Corliss Steam Engine. One 40 H. P. plain slide valve Steam Engine.
> One 12 H. P. vertical Steam Engine. Naylor.
> One 60 H. P. Warine Boiler, suitable for sug boat.
> One 25 in. heavy Endless Bed Surfacer.
> Three Cylinder Boilers, 36 in. dia. x 30 ft. long.
> One second-hand No. 7 Sturtevant Pressure Blower.
> A large lot of Steam Fumps of various kinds and sizes.

For Sale.

Palo Alto Rolling Mills, Near Pottsville, Pa.,

ON THE MAIN LINE OF THE POTTSVILLE AND READING RAILROAD.

These mills are in good repair, and can be tarted in two days' time.
Rolls for T-Rails 12 to 70 lbs. per yard, and for street Rails 18 to 70 lbs. per yard.
Guide Mill Train for Merchant Iron ¼ to 1 inch.
Rolls for Merchant Bar, round and square, up to

Rolls for Merchant Bar, round and square, up to 4/5 inches.

Number of Puddling Furnaces in both mills, 30; Heating Furnaces, 0; all with boilers attached.

Also Foundry, Machine Shop, Blacksmith Shops, Iron Heuse, Roll House, Carpenter and Pattern Shops, Stables, handsome Dwelling for Superintendent, 11 Tenement Houses, a Brick Office, and ample grounds for stock and cinder.

For further particulars address

Messrs. LEE & McCAMANT, Extrs., Pottsville, Pa. THOS. F. WRIGHT, 1804 Race St., Philadelphia, Pa. HUGH W. ADAMS, 56 Pine St., New York.

ROLLING MILL AT CANTON (Baltimore City, Md.), FOR SALE.

Under the provisions of a deed of trust from Anderson Bros. & Co., I will sell at public auction, on the premises, at Canton (Baltimore), Md., on May 5th. 183, at r. P. M., the rolling mill lately operated by Messrs. Anderson Bros. & Co.

The mill occupies a square of ground, with rail-road connection by a switch belonging to the property, and is within a few squares of the Canton Co. 's wharf.

The improvements consist of a rolling mill well

ton Co. s wharf.

The improvements consist of a rolling mill well equipped for the rolling of merchant bar, six double pudding furnaces (are incomplete), two heating furnaces, one rotary squeezer, two trains of rolls, 15 and 8 inches with enzines, pumps, boilers, shears, fan, and other machinery necessary for manufacturing bar iron.

The property is subject to a redeemable ground rent of \$1550.

Purchasers will have the content of the content of \$1550.

Purchasers will have the right to remove the machinery and furnaces, if they so desire, upon payment in full of purchase money.

Terms: One-third cash, balance in equal installments in six and twelve morths from day of sale; deferred payments to bear interest from day of sale; or all cash, at option of purchaser. Private bids requested.

sale; or an easily, bids requested. RANDOLPH BARTON, Trustee, 29 N. Calvert St., Baltimore, Md.

For Sale. Bolt and Nut Machinery.

Bolt Cutters, National, capacity up to 1 in, to Bolt Cutters, National, capacity up to 1½ in, Bolt Cutters, National, capacity up to 1½ in, Bolt Cutters, National, capacity up to 2 in, Bolt Cutters, National, capacity up to 2 in, each, 3 in, and 4 in.
National Bolt Headers, capacity up to 1 in, National Bolt Header, 1½ in.
Improved Lewis Bolt Header, capacity up to 1½ in 1½ in.

I Improved Levis 1/6 in. Several Chapin Headers, light and heavy; Nut Tappers, a complete assortment; Cold Headers for Rivets, Store Bolts, &c.; Hot-pressed Nut Machines, sizes; Washer Machinery, and every variety of tool used in Bolt and Nut Shops. The only specialists in line in the United States, Address

ddress THE NATIONAL MACHINERY CO., Tiffin, O. Catalogues sent free to any address.

For Sale.

A well-established Hardware, Stove and Tinware business in Paola, Kan. Population, 3500: intersection of Missouri Pacific and Kansas City, Fort Scott & Gulf Railroads. Stock clean and will invoice about \$10,000. One other hardware store. Address LOCK BOX No. 57, Paola, Kan.

ROLLING MILL PROPERTY For Sale at Low Figures.

The Rolling Mill at Poughkeepsie, N. Y, with the entire plant and machinery, about 15 acres of land, large and valuable water front, with substantial whar?. One of the best locations in the country for manufacturing.

Apply to W. S. JOHNSTON, Trustee, Poughkeepsie, N. Y.

For Sale.

Mc. 6 Startevent Plower and Countershaft. 6 Blake Steam Pumps. Good as new. Nos. 3, 4 and 5 Phila. Hydraulic Works Steam

Nos. 3, 4 and 3 and 5 Pramps.

Belt Pump for Hydraulic Press.

Heald & Sisco Centrifugal Pump, 4-in. discharge.

Small Steam Blowing Engine.

Small Steam Blowing Engine.

A. G. BROOES & WINEBRENER,

ses N. 3d St., Philadelphia.

For Sale.

MACHINES FOR MAKING PICKS, MATTOCKS AND AXES.

With Solid Punched or Adse Eyes T. & CO., Box 25.

Office of The Iron Age, 83 Reade st., New York

For Sale.

To a competent Mechanical Engineer, with experience in managing Machine Shops, an interest in the Omaha Foundry & Machine Co., at Omaha, Neb. The largest and best equipped shops in Nebraska, with a splendid trade and no local competition. Address

T. W. T. RICHARDS,

T. W. T. RICHARDS, Omaha, Neb.

Special Notices

TO MANUFACTURERS

And Others Desirous of Introducing their Coods or Increasing their Trade in Cuba and the West Indies,

The West India & Panama Telegraph Company, whose times extend through Cuba, Porto Rico, Jamaica, St. Thomas, St. Kitts, Antigua, Guadaloupe, Dominica, Martinique, St. Lucia, Barbadoes, St. Vincent, Granada. Trinidad, and from Colon to Panama, have ordered a special edition of 5000 copies of "Palmer's Foreign Buyers'. Guide," which will contain the Rules and the New Tariffs of the Company, the United States import duties on articles from Cuba and West indies and other valuable information. These books are almost indispensable to the business houses of these countries, and will be preserved and constantly referred to. They will be presented by the Company to the General Merchants, Hardware Houses, Importers and Rusiness Men in all the Cities throughout their entire system.

The edition I recently published for the Mexican, Central & South American Telegraph Companies was indorsed by the leading export houses in New York, mary of whom advertised in it. (3500 copies were subscribed for by the exporters and forwarded to their correspondents.) This book will be prepared somewhat similar and 2000 extra capies will be printed to supply the exporters, thus making an edition of 7000 copies in all.

the exporters, thus making an edition of 7000 copies in all.

A limited space will be reserved for advertisements of American Manufacturers and others desirous of cultivating their trade with these countries. Every advertisement will be placed opposite some matter which will be constantly referred to. Those familiar with the aim of advertising know that the most effective card is one that is kept constantly before the eyes of the people whose patronage they solicit, and to be thoroughly understood must be in the language of those people; consequently, 3500 copies will be printed in Spanish for distribution through Cuba and Porto Rico, and 3500 in English for the other Islands and places. This mode of advertising is far superior to any circular or newspaper advertisement, for the reason that it is the only publication that has received the unanimous indorsement of the leading export houses. The exporter being the intermediary between the manufacturer and the foreign buyer, it will be readily seen that a book subscribed for by them and sent to their foreign corresponsionless carries more weight than any other publication could, and goods advertised in it are those that will be inquired for and bought. Many of the advertisers in the Mexico edition have already received orders through the export houses and renewed their advertisements.

Reference to some of the Exporters and

Reference to some of the Exporters and Manufacturers who Subscribed for and Advertised in the Mexico Edition :

EXPORTERS.

W. H. Crossman & Bro., Leaycraft & Co., Louis Monjo & Co., W. R. Grace & Co., Fred'k Probst & Co., Jacob Baiz. A. M. Capen, D. M. Piza, Marcial & Co., C. Adolphe Low & Co., etc., etc.

MANUFACTURERS.

Collins & Co. (hardware), Lamson & Goodnow Mfg. Co. (hardware), Stanley Rule & Level Co. (hardware), H. K. & F. B. Thurber, F. Alexandre & Sons (Mexican S. S. Co.), Hartshoren (snade rollers), Brown Bros. (hankers), Merwin, Hulbert & Co. (arms and ammunition), Dean Steam Pump Co., Domestic Sewing Machine, Joseph C. Todd (machinet), The Newall Universal Mill Co. (machinet), etc., etc.

RATES FOR ADVERTISING.

1 Page, in English and Spanish, \$50.00 27.50 6.6 6.6

For further particulars, address

I. E. PALMER.

128 Broadway, New York.

PROPOSALS FOR TICKET PUNCHES.

PROPOSALS FOR TICKET PUNCHES,

POST OFFICE DEPARTMENT,

WASHINGTON, D. C., May 1, 1883, (
SEALED PROPOSALS will be received at this
Department until the second day of June, 1883, for
furnishing 6,500 Ticket Punches, either stationary
or in the form of pliers, to be delivered at this Department on or hefore the tenth day of Jugust, 1883.

The punches are to supply a new want of the
service, being required for use in the issue of
postal notes. Bidders will submit with their proposals samples of the punches offered to be furnished by them.

All proposals are to be made in accordance with
the printed forms and specifications, which will be
furnished on application, by letter, to the "Superintendent of the Money-Order System, Post Office
Department, Washington, D. C., "to whom bidders
should address their sealed proposals, marked on
the envelope, "Proposals for Punches."

A decision on the bids will be made on or before
the sixth day of June, 1883, the right being reserved to reject any or all of them.

W. Q. GRESHAM,
Postmaster General.

Mechanical Engineering, Electrical Engineering,

Civil Engineering

For the University Register, containing full state-ments regarding requirements for admission, courses of study, degrees, honors, expenses, free scholarships, etc., and for special information, apply to The Pres-ders of Consell University. Thaca, N. Y.

Wholesale Hardware Auctioneers,

83 Chambers and 65 Reads Sts., N. Y.

IRON AND METAL

Bought and Sold by WIL WILLIS MERRILL, 4 Stone Street, Room 69. Dealer in

EXCHANGE MEMBERSHIPS. always put faith in the estimate of 28 % of POREMAN WANTED to run a small Carriage Bolt Shop; competent to repair machines and fit dies. Address BOX 62, Gananoque, Canada.

WANTED.—A position by a young man with
15 years' experience in Hardware and
House Furnishing Goods. Good salemma and
posted in buying. Best of references.
Address
Office of The Iron Age, 83 Reade St., New York.

depend on crop prospects and current prices.
In dry goods the demand has been indifferently been unsatisfactory. Cotton develops weakin 1881.

The following is a comparison of the

Trade Report.

BRITISH IRON AND METAL MARKETS.

Special Dable Disputch to the Line Age.]

LONDON, WEDNESDAY, May 9, 1883. Scotch Pig.-The market is irregular. Makers' prices are quoted as follows:

Coltness, alongside, Glasgow Summerlee, Carnbroe Glengarnock, Eglinton, Ardrossan.... Eglinton, Dalmellington, " at Leith ... Shotts, Lighterage from Ardrossan to Glasgow is 1/ ? influence on values.

ping ports:

Middlesboro' No. r Foundry No. 2 42/ No. 3 4 39/6 40/ No. 4 Forge. Bessemer Pig-Is weaker, and quotations

are reduced to 50/@ 51/ for mixed lots Nos. 1, 2 and 3, equal parts, W. C. Hematites. Blooms-Continue without change. Besemer 7" x 7" are quoted £4. 10/@ £5, f.o.b.

shipping ports. Manufactured Iron.-The market is irregular. We quote at works, nominally: Hoops, 20 W. G. and over. Common Best..... 7 5 0 @ 7 15 Medium....... 6 10 0 @ 6 15 Common...... 6 5 0 @ 6 10 20 W. G. and under. " ('ommon Sheets, 20 W. G. and under. Ordinary Best.... g to o@ to to 7 10 0 @ 8 0

Steel Rails .- The market is weaker than at date of last report, and Ordinary Sections are now quoted_£4. 12/6 @ £4. 15/, f.o.b shipping ports.

Iron Rails-Dull and nominal. Welsh, to the and upward, are quoted, nominally, £4. 15/ @ £5. 10/, f.o.b. shipping ports.

Old Rails .- The market is quiet, with

prices firmer. We quote Old Tees, c.i.f. New York, £3. 10/ @ £3. 12/6, and Old D. H.'s, same port, £3. 15/. Scrap-Continues in small request and

irregular. We quote Heavy Wrought, c.i.f. New York, £3. 2/6 @ £3. 5/. Bessemer Crop Ends are quoted 60/ @ 62/, f.o.b. shipping ports, for run of the mill. Copper.-The market is weaker. Best

Bars, £62 @ £62. 10/. Tin-Is irregular. We quote Straits Ingots, spot, £95. 15/@ £96. 5/, and futures,

£96. 15/, @ £97. 5/. Spelter-Continues weak and drooping. Ordinary is quoted £14. 15/ @ £15 at

shipping ports. Lead-The market is quiet and unchanged. Common English Pig is quoted £13. 5/@ £13. 10/

Freights.-Steam from Glasgow to New York, 5/, and Liverpool to New York, 3/6 @ 5/6; Liverpool to Philadelphia, 9/; London to New York, 10/@ 10/6.

FINANCIAL.

Office of The Iron Age, Wednesday Evening, May 9, 1883.

cities there is an increase in the clearings, | rope during the past two years." the largest being in Chicago, Cincinnati, St. the exhibit is more favorable than for sev-Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

the exhibit is more favorable than for several months. The produce market has been largely oversold, sometimes compelling opernow a question of special interest. The the corresponding period last year : United States Agricultural Department have the previous crop, or 143,000,000 bushels, in farmers' hands March I, and the forward

In monetary circles the special feature of the week is the large business done in railway mortgages, securities of this class seeming to be more in favor than for severa years past, and, taken as a whole, a material advance is recorded. The improvement is due in part to the passage of "the Page bill" in the State Legislature, permitting savings banks a wider range in seeking investments. Chovernment bonds are correspondingly depressed. There being a strong opposition to the measure among conservative financiers, the Governor may possibly withhold his signature.

On the Stock Exchange the upward movement in prices made further progress, but in some cases the speculative situation fails to show the desired improvement. Interest was chiefly centered on the retirement of .49/6 Mr. Vanderbilt from active participation in railroad management, but the event had little

A temporary depression in New York Clevleand Pig.-The market is a little Central and Lake Shore on Thursday and steadier. We quote as follows, f.o.b. ship- Friday, arising from adverse rumors, was recovered on Monday, when New Jersey Central led in a sharp advance, on a report that the road will soon be leased to Reading. The Gould properties were also moved upward under speculative treatment, and on Tuesday the tone was generally strong. Today stocks were weak and 1/4 @ 1 1/8 lower on the general list, as will appear from the following sales toward the close: St. Pau at 105 1/8, 104 1/8, 105, 104 5/8, 104 3/4 : Lackawanna at 1271/8, 1267/8, 1271/4, 1265/8, 1267/8 Central Pacific, 75 1/4 @ 75 1/8; Union Pacific at 97½, 97, 97½; Lake Shore at 111 @ 110¼; Denver at 50, 49½, 50½, 49¼; Canada Pacific at 62, 6174, 6214, 6178, 6178 New York Central, 1221, 1221, 1221; Jersey Central at 80, 79%, 80, 79%; Burlington and Quincy at 126 @ 12514; Missouri Pacific at 105 % @ 105; Erie, 36 1/2 @ 363%.

Sterling Exchange is quiet, but to-day is steady, with but few commercial bills offer-The posted rates are \$4.84 for 60-day and \$4.86 for demand. Money is easy at 3 @ 5 % on call. We quote 60 to 90 days' indorsed bills receivable, 5 @ 51/2 %; four months' ac-

ceptances, 51/2 @ 6 %. The exports of domestic produce from the port during the past week were quite heavy for this season at least, the total being \$7,583,931, against \$6,144,891 for the corresponding week last year. The shipments o petroleum show a decided increase over the previous week, and are quite heavy. Cotton is moving out to a very good extent. is also a fair movement of breadstuffs, although the exports of flour are very moder-There has been a considerable increase in the shipments of rye. Provisions are being

shipped to a fair extent. United States bonds are lower, but to-day Selected is quoted, £68 @ £69, and Chili 41/2's advanced; the closing quotations were

as follows: S. 5'8, 1831, continued at 3½.
S. 4½'s, 1891, registered.
S. 4½'s, 1891, coupon.
S. 4'8, 1997, registered.
S. 4'8, 1997, coupon.
S. 7 per cents.
S. Currency 6'8, 1895.
S. Currency 6'8, 1895.
S. Currency 6'8, 1897.
S. Currency 6'8, 1897. Asked.

State bonds are neglected. Railroad bonds were active and firm. The largest business today was in West Shore bonds and East Ten-

Specie payments have been in successfu operation in Italy for nearly a month. The following interesting particulars are from the

"By one of the clauses of the Resumption law, the Government may exact gold for In the general markets the business of the customs duties, if it chooses, but it is aupast week is not characterized by many new thorized to accept paper currency of denomfeatures. There is observable, however, a inations not lower than \$10 of American steady tendency toward improvement, and money. The volume of bank notes during we may readily accept the views of a lead- the suspension of specie payments has been CORNELL UNIVERSITY. ing mercantile agency, which finds evidence that the country is "adjusting itself anew for a further period of activity;" further-lindeed, if that volume of bank notes is remore, that "there exist good reasons for tained, the aggregate of the Italian monetary believing that trade and finance in the circulation will certainly not be excessive United States have already undergone as It will be reduced to \$160,000,000 of bank much or more of a crisis than will be notes and \$68,000,000 of Government notes, encountered in the immediate future." At being a total of \$225,000,000, or about \$8 and Architecture. the same time, there is apparent a sluggishness in keeping with the tardy advent of ver full-tender coin from other countries to ENTRANCE EXAMINATIONS BEGIN AT spring. Little satisfaction is found outside effect the Italian resumption has been about 9 A. M., JUNE 18 and SEPT. 18. 1883. of speculative movements, which have no \$70,000,000 of gold and \$15,000,000 of silnecessary connection with either supply or ver, or \$85,000,000 in all, in addition to the demand. The bank clearing-house exchanges \$15,000,000 of Italian subsidiary silver which of this city the past week show a decrease of was redeemed from the Bank of France. 26.2 %, compared with the corresponding This has put a strain upon the European E. BISSELL & CO., week last year, thus reflecting the dull con- money markets, and the prices of commodities in Euweek last year, thus reflecting the dull con- money markets, and is one of the causes of

According to the Custom House reports, Louis and Indianapolis. New York excepted, the importations of specie and bullion at this port during the week ending May 4 were \$29,251, consisting of \$6905 in gold and largely oversold, sometimes compelling oper- \$22,346 in silver, as against a total of \$37.498 ators to cover their contracts at considerable for the week ending May 5 last year. The loss. In the grain trade, the quantity of importations since the act of January com-Exchange Memberships wheat remaining in farmers' hands is just pare as follows with the movement during

-Since January 1 Total..... \$0,492,259 \$1.500,132

The bank return for the week shows an movement for consumption must largely increase of \$708,925 in reserve, which now depend on crop prospects and current prices, stands at \$1,604,125 above, against \$0,650,

Quan.

April 28. May 5 Differences.

Loans\$312,895,000 \$315,577,400 Inc. \$2,612,400

Specie\$53,736,800 55,769,130 Inc. 2,032,330 Legal tend-Legal tend-ers...... 19,639,000 a9,077,600 Inc. 438,600 Deposits... 269,072,470 a9,697,300 Inc. 7,047,900 Circulation. 16,342.400 16,233,600 Dec. 108,800

MINING STOCKS. The closing prices for mining stocks were

The closing bures for mining	510 B	0 1101
as follows:		
	Bid.	Asked
Amie	20	21
Alice	3.10	****
Belle Isle	4.8	45
Bodie		1.35
Bulwer	53	
Bradshaw	35	47
Caled, B. H	75	80
California	2,3	26
Climax	7	1.0
Con. Va	47	53
Chrysolite	1.05	1.15
Central Ariz	38	33
Cherokee	3	4
Dahlonega	3	4
Decatur	3	4 51
Eureka Con		07
Elko Con.	30	
East, Or.	30	50
G. Prize	1.00	0)
Gr'n Mtn	75	1.50
Harlem	1.45	63
Iron Silver.	2.90	2.05
Lacrosse.	11	13
Leadville, Con		79
L. Pitts	65	€4
L. Chief	52	54
Maryland Coal	12	24
Mexican	8.50	3 00
Navajo	8.35	8.50
N. Belle.	834	83
N. Belle Isle	30	36
Quicksilver		8
Ontario	2436	263
Ori, & Mil		16
Sierra Grande	1.00	0.4.6
Rappahannock	7	- 8
Robinson Con.	85	89
Rising Sun	3	4.8.8.8
Silver King	10	
Standard	636	6
Silver Cliff	15	31
Sutro Tun	****	21
Sonora Con	40	42
So. Hite, new	10	00 8 8
So, Pacific	4	5
St. L. 1 & 4	9	****
St. L, 2 & 3	4	

GENERAL HARDWARE.

There is little to note in regard to general business, which is going on, as for some time past, without any special feature to remark. The only important change in prices is the reduction in Wrought Butts, noted below.

The demand for Nails is active, not only from ordinary local trade, but a considerable inquiry from California has sprung up within a few days. Stocks have become very much reduced in quantity and the assortments much broken by the brisk demand which has prevailed for the past two or three weeks, and we hear of considerable buying and borrowing between dealers. There is, however, no change in prices, nor is there any expectation of an improvement, except in the case of a strike in the West, We continue to quote \$3 as the price for small sales, with the usual concessions for desirable orders.

The Stanley Works, Roy & Co., the Mc-Kinney Mfg. Co. and the Ætna Nut Co. have just issued the following circular reducing the prices of Wrought Iron Butts:

APRIL 28, 1883. Dear Sirs: We, the undersigned, manufacturers of Wrought Iron Butts have this day adopted the following discounts:

Narrow Buttsdis,	\$ 0120g
Light Narrow Butts	500 10 %
Inside Blind Butts	
Table Hinges	SORTO S
Back Flaps	508 10 \$
Square Back Flaps	500 10 %
Pew Door Hinges	500 to \$
Broad Butts	
Reversible and Loose Joint Butts	\$ 01 202
All former quotations on Wrought	Butts,
whether given by ourselves, our age	ents or
salesmen, are hereby withdrawn.	

The following is the circular issued by the Stanley Works:

NEW BRITAIN, CONN., April 28, 1883.

We	ave this day adopted disco	ounts	a
follows	:		
Strap ar	d T Hingesdi	8. 55&	10
Wrough	Narrow Butts, No. 800	500	10
20	Table Hinges, No. 810,	50d	10
8.6	Back Flaps, Nos. 814, 816	500	10
80	Inside Bund Butts, No. 812	J. 500	10
8.0	Pew Door Hinges, No. 818	. 50d	01
8.0	Chest Hinges, No. 820		
8.1	Broad Butts, No. 858	202.	10
64	Light Inside Blind Butts, No. 84	2 50dC	10
**	" Narrow Butts, No. 838	2000	10
9.6	" Reversible Butts, No. 834.	50001	to !
**	" Loose Joint Butts, No. 830	5. 5000	10
Wrough	Light Narrow Loose Pin But	ts. No	э,
B40		13000.	no f
Wrough	Light Inside Blind Loose Pin	Butts	Š.
No. 84		500	io !
Wrough	Light Inside Blind Butts, Edge	Holes	6.
No. 84		12000.	0
Wrough	Light Inside Shutter Butt	B. No	1.
Wrough	Extra Light Butts, No. 82'	1202.	10
2.5	Reversible Butts, No. 804	12000	0.5
8.0	Loose Joint Butts, No. 8c6	Dez	0
3.0	Light Inside Blind Butts, No. 33: Narrow Butts, No. 284	2008.	10 5
Bronzed	Light Butts, Nos. 286, 288, 290, 1	202. 13	8.
	STANLEY W		

firm of Smith. Cohu & Co., which occurred \$2.20. suddenly on the 5th inst. from heart disease, loses one of its oldest members, and the city if buyers were in the market it propagaly a worthy citizen. He had no family, could be bought for less; ex-store at \$24.50, and being of a quiet and unobtrusive ex-ship at \$23.50, and Crop Ends at \$22. Carey & Moen, Wire, coils, 73 Electrical supply Co. Wire, psgs., 172 of stock an active business life were suffered to engage his attention. His early business associations were in the firm of Widdifield, Cohu & Co., nearly forty years ago, and then Mooney, Cohu & Co., who went out of business about 1861 or 1862. After ten years of comparative retirement, he became instru- the way between 14 4 and 15 12 c. Co., who have an honorable record, the house tak, ing rank among the few houses of prominence in the Hardware jobbing business of

ness will be continued at the old stand, under the name of Smith, Lyon & Co.

The attention of the trade is requested to the advertisement of the Common Sense Sash Holder and Lock Combined, on page This article is claimed to be the best 28. and cheapest article of the kind in the market, and, from the large sale it is having, it last night £96. We receive since then the is doubtless a desirable article for the trade to handle. For further particulars see advertisement as above.

We call attention to the advertisement on page 32 of F. O. North & Co., 276 Devonshire street, Boston, proprietors and sole manufacturers of the Automatic Blind Awning Fixtures. North & Co., having extended their facilities for the manufacture of the above-mentioned article, are prepared to meet the demand, which they claim to be a large and increasing one.

IRON.

American Pig .- The tone of the market is even more depressed than in previous weeks, and the reduced prices are freely cut by some of the leading companies. We hear of concessions of from 50 cents to \$1 a ton. Buvers maintain their attitude of indifference, and are almost unanimously of the opinion that they will be the gainers by postponing their purchases as long as possible; consequently, most of them are buying in quantities which appear insignificant in comparison with their usual orders. The belief seems to be very general that Iron must at least go to \$20 before there can be any hope of a reaction or even of firm prices. The recent decline does not seem to have lessened production, nor does there seem any immediate prospect of any large decrease under present conditions. This would seem to render a 1/4 further decline in prices inevitable, for, as we have so often pointed out, the price must decline till it becomes low enough to materially lessen the output. Transactions during the week bave been in small lots, and no important sales can be reported. We quote for standard brands: Foundry No. 1, \$21.50 @ \$22; Foundry No. 2, \$19.50 @ \$20; Gray Forge, \$18.50 @ \$19.50.

Scotch Pig .- The arrivals of Scotch Pig have been limited, and although the transactions have been small and confined to the present requirements of buyers, the amount here has been very much reduced, and transactions conform more nearly to quotations although sales have been generally small and buyers show little disposition to buy Iron to arrive, preferring to take the chances of the market at the time the Iron may be needed. We quote: Eglinton, \$21.25 from ship, \$22 from yard; Carnbroe, \$23 from yard; Glengarnock, \$22.50 @ \$23 from ship and yard; Dalmellington, \$21.50 @ \$22 from ship; Summerlee, \$24 @ \$24.50 from ship Coltness, \$24.50 @ 24.75 from ship; Gartsherrie, \$25 from yard; Langloan, \$24.50

Old Ralls.-The market is excessively dull, and there is almost no demand. We hear of only unimportant sales. We quote

\$23 for T's.

Steel Ralls.—While we do not hear of any important transactions this week, there is a good deal of inquiry for large lots from Mach'y, cs., 2

Mach'y, cs., 2

Markt & Co. mails od buyers, and it seems certain that Eastern mills will have fuily all they can do during this year : indeed, the probability seems to be that the demand will be greater than they can supply. Still, prices remain unchanged at about \$38 at works.

Bar Iron .- The decline of a few weeks ago in Crude Iron has destroyed all activity in the Bar Iron trade, and to-day finds it more quiet than it has been for several years. The principal cause is the uncertain condition of the Pig Iron market. Consumers are under the impression that this class of Iron will meet with further reduction, which will probably affect the price on Finished Iron. Buyers will not order except as they need it until they are certain that the bottom has been reached. The limited demand has made prices weak, and dealers do not hesitate to make concession for the purpose of catching what few orders are on the market. They freely s admit, however, that even on the small amount of business they are doing on this basis they are losing money. Manufacturers will not accept orders for delivery beyond the 1st proximo, and receive only such as they can fill before that time. Prices at the s mills are quoted at \$1.90 @ \$2.15, according to quality; from store, Refined Iron is quoted By the death of Henry S. Cohu, of the at \$2.35 @ \$2.45, and Common at \$2.10 @

Scrap Iron.-The decline in other Irons of which he had had little previous warning, has caused a weakness in this. Selected the wholesale Hardware trade of New York Yard Scrap is now held at \$25.50 @ \$26, and

METALS.

Copper.-Sales for the week sum up some Cohy & Co., nearly forty years ago, and then with their successors, whose firm name was proved feeling in the better kinds of Copper, and Lake, of which little offers, is very firm at 1576¢ @ 16¢, while other brands range all mental in organizing the firm Smith, Cohu & cabled the last few days £62, Chili Bars, and £69, Best Selected: the difference between there this afternoon as follows: "Market weaker. Best Selected, £68 @ £69, and Chill Bars, £62 @ £62. Io.'" No official change has yet been made in the combinations of the combination New York. Mr. Cohu was in the 62d year Chill Bars, £62 @ £62, 100," No official of his age. As is set forth in an advertise-change has yet been made in the combina-

averages of the New York banks for the last ment among our Special Notices, the busi- tion prices of manufacturers. They remain Bottoms, 31¢ @ ¢32¢; Braziers, 30¢ @ 36¢; Circles, 33¢ @ 36¢; Sheathing, 28¢, and Bolt Copper, 30%; Segment Sheets, 33%; Fire-Box do., 30%. Considerable shading from these rates is said to be going on, but 30%; Segment Sheets. to what extent it is not easy to ascertain.

Tin.-The market here has been inactive at 211/4 for Straits Tin, while London cabled cablegram below: "Tin is irregular. Straits Ingots, spot, £95. 15/@ 96. 5/, and futures, £96. 15/@ £97. 5/." Lamb and Flag may nominally be quoted 22¢. Tin Plates.—Activity has revived and a better feeling ob-We quote large lots, ordinary brands, tains. Panns. We quote large loss, ordinary brains, \$2 box to-day: Charcoal Bright, \$5.87½ @ \$6.25; do. Ternes, \$5.25 @ \$5.50; Coke Tin, \$5.15 @ \$5.25, and do. Ternes, \$5. From Liverpool quite a firm market is reported per cable. Charcoal is worth there 18/@ 20/6, and Coke, 15/9 @ 16/6.

Lead.—Since we last reported, a couple of hundred tons have been sold at \$4.40, but since then \$4.45 @ \$4.50 is asked for Common Domestic, while for Refined not even \$4.40 can be obtained; in fact, it is unsalable for the moment, and it has been intimated that on large lots the price would be shaded from the figure named. Lead is in an unsattled emolition; it heing estimated in an unsettled condition, it being estimated that the East consumes so far about onethat the East consumes so far about one-third less than last year, while the amounts in sight are more than ample. St. Louis is \$4.10 with Hard and \$4.15 Soft, with a freight of 351/24, soon, we hear, to be fur-ther reduced. From London we receive ther reduced. From London we receive the ensuing cable message this afternoon:
"Market quiet and unchanged. Common English Pig, £13. 5/ @ £13. 15/." Manufactures are quoted as follows: Lead Pipe, 6¼¢; Sheet Lead, 7½¢; Tin-lined Lead Pipe, 15¢ % lb., and Block-tin Pipe, 45¢, loss the usual discount to dealers.

Spelter and Zinc.-The state of apathy into which Common Domestic Spelter has re-lapsed has had no relief during the week, the market remaining featureless at 434 and below, according to quantity and brand, while Silesian is nominally worth 5/4%. Bertha Refined may be quoted 7/4% @ 8%, and Bergenport, 9/2%. Sheet Zinc has been measurably active at 6/4%. From London we are wired to the following effect to-day:

"Spelter continues weak and drooping. Ordinary States, of the state of while Silesian is nominally worth 51/8# dinary, £14. 15/@ £15, at shipping port.

Antimony.—Our market does not develop the desired amount of liveliness. We quote desired amount of liveliness. Hallett 97/8¢, and Cookson 107/8¢.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending

May 9, 1883. Old rails, lot Hardware. Old rails, lot Castings, Kegs, 8 Castings, pkgs., 4 Rails, 884 Rails, tons, 198 Wire rods, bdls., Booth & Co. Nails, kegs, 35 Boker Hermann & Co. Cuttery and guns Clark G. A. & Bros. Chark G. A. & Bros.
Machinery, cs., 73
Dolge Alfred,
Mdsec. cs., 5
Degrauw, cy., 5
Chain, cks., 7
Chain, length, 1
Drexel, Morgan & Co.
Arms, cs., 7 Ore, tons, 600
Wrought beams, 50
Bundles, 477
Wrought, trns, 50
Cast, tons, 160
Tubes, 140
Spiegel, tons, 513
Horse shoes, tous, 26
Old horse shoes, tons, 50n
tons, 25 Arms, cs., 7 Casks, 9 Field Alfred & Co. Cutlery, cs., 9 Cases, 4 Anvils, 9 lef Cutlery Co. tons, 25 Graet Steel. Abbott Jere & Co.

Abbott Jere & Co.
Tires, 19
Cases, 43
Brown Bros & Co.
Wire, coils, 1coo
Carey & Moen,
Bundles, 249
Casks, 16
Goaun W. & Sons,
Metal ware, cs., 2
Ladenburg, Thalma
& Co. Markt & Co.
Furniture nails, cs.,
Mdse., cs., 2t
Morton. Bliss & Co.,
Nails, pkgs., 710
Moore's Sons J. P.
Gun caps, cs., 2
Mdse., cs., 2
Moss F. W.
Files. cks. Metal ware, cs., 2 Ladenburg, Thalma, & Co. Wire, bdls., 8co Merch. Disp. Co. Bundles, 8o Moss F. W. Bundles, 45 Bars, 45 Temple & Lockwood, Packages, 188 Tomilinson Spring Co. Bundles, 37 Moas F. W. Files, cks., 4
McCog & Sanders
Casks, 8
Chains, cask, 1
Mach'y, cs., 2
Schoverling, Daly &
Gales,
Mdse., cs., 4
Arms, cs., 4
Struler, Lau & Co.
Mduc, cs. Bundles, 37 Wagner W. F. W. Johns Mfg. Cases, 33 Wood, Niebuhr & Co, Rods, pkgs, 617

Metal ware, cs., 4 Iron Clad Mfg. Co.

The H. W. Johns Co. Nails, kegs, 60 Taylor Thos. Rods, pkgs , 617 Order. Bands, 85 Wire, bdls., 7415 Rail ends, tons, 180 Bundles, 770 Strips, cks., 25 Bloom ends, tons, 2 Bloom ends, lot Cases, 4
Thompson Lucas,
Sew. mach., cs., 11
Tryon E. K., Jr.
Gun caps, cs., 4
Trier Bros. Casks. 35
Ward Alsine,
Mdse., cs., 13
Wiebusch, Higer & Co.
Hdw., cutlery and
guns, pkgs., 17 Metals. Agostini J.
Old copper, bxa., 19
Bank of Montreal,
Tin, cs., 3019
Baring Bros. & Co.
Tin plates, bxs., 235
Dickerson, Van Dusen &
Co.
Antimony, cks., 50
Tin plates, bxs., 359
Eggers & Heinlein,
Old copper, cs., 2
Erie & Pacific Dispatch,
Tin plates, bxs., 1180
Glese & Glocke
Metal, cks., 80
Hollender Fred.
Metal ware, cs., 4 Agostini J. der. Mach v, cs., 21 Mach'y, pkgs. 4 Arms, case, 1 Casks, 26 Packages, 25

Iron. Baring Bros. & Co. Rods, bdls., 14.555 Wire rods, bdls., 6489 Wire rods, colls, 1945 Pig. tons, 200 Brown Bros. & Co.

Iron Clad Mfg. Co.

Tin sheets, cs., 3
Jex Wm. & Co.
Old copper, case, 1
Katz Bros.
Tin. slabs, 4477
Ketchum E.
Tin plates, bxs., 437
Lamarche H. & Co.
Zinc. cks., 34
Phelps, Dodge & Co.
Tin plate, bxs., 448
Purdy & Nicholas,
Tin capsules, cks., 2
Sidney Shepard & Co.
Tin plates, bxs., 550
Zucker & Levett,
Oxide of lead, case, 1
Order, Ladenburg, Thalmann & Co.
Wire rods, coils, 1011
Lee Jas. & Co. Pig, tons, 100
Mason John W. & Co.
Wire rope, reel, 1
Wire rope, coils, 3
Mason Mtg. Co. Mason Mfg. Co.
Pig. tons. 50
Naylor, Benzon & Co.
Coils. 993
Spiegel, tons. 900
Pierson & Co.

Quan, Val. Bremen. Quan. Val.
Ptl.,gls.1,581,007 \$123,775
Ag. imp., pkgs 175 5,881
Tin plate, bxs 18 180
Naph., gls.102,992 11,400 Copper, cks .. 161 39.807 Mach'y, pkgs. 3 145 Sew. ma., cs. 35 680 Dunkirk Mf. iron, pkgs 103 547 Mach'y, pkge. 1 758 Bilbao.

EXPORTS

Dutch East Indies. Ptlm., gals.250,000 28,500 Amsterdam. Aarhuus. Ptl m.,gals.224,974 17,800 Arendal. Ptlm., gals.332,316 26,325 Hamburg.gls.,3,257,504 256,689 Hdw., pkgs... 10 622 Cop. wire, cs. 38 3,754 Knit, mach. cs. 7 855 Ag. imp., pkgs 20 443 Blower..... 2 50

Blower...... # 50 Mach'y, pkgs. # 13 2.849 Sew. ma. cs. 1212 23,152 Clocks, pkgs. # 18 284 Guns, cs.... # 1 2,289 Ptlm., gals.324.850 24,375 New. ma., cs.. 51 385 Ag.imp.,phys. 30 2,750 Mach'y, pkgs. 6 2,600 Rotterdam. Ptlm, gals. .631,192 51,0 Bordeaux, Sew. ma., cs.. 101 Alicante Christiania. Hdw., pkgs.. 49 846 Barcelona. Antwerp.

Ptl., gla., 1,846,013 152,567 Sew. ma., cs. 170 2,437 Hdw., pkgs... 35 437 Mf.iron, pkgs... 140 Napth., gls. 183,791 17,027 Ag.imp.,pkgs. 10 Hdw., cs.... 21 Shears, bxs.. 5 Cop. wire, cs.. 37 Ag. imp.,pkge 1 Constantinople. Tomsoe. Ptlm., gals.. 56,929 5,695 Alexandria. Elsinore. Ptlm., gals.230,000 23,0 Ptlm., gals. 322, 194 25, 529

Copenhagen. Mach'y, pkgs. Hdw., cs..... Cuba. Hull. Mf. iron, pkgs 134 Mach'y, pkgs. 26 Scales, case... r Ag. imp.,pkgs 18 Mf. iron, pkge 1 Hdw., pkge . r Clocks, pkgs. 17 Exmouth. Naph.,gls..133,400 9,500 Gibraltar.

Scales, hhds.. 2 Cork. Iron safes Ptlm., gals.216,198 17,80 Noils, kegs.... 18 Hdw., pkgs... 2 Sew.ma., 08... 3 Ptim., gais... 548 Cutlery, cs... 6 Mf. iron, pkgs 3 Shot, bags... 40 Liverpool. 100 Sew. ma., cs. - 73 Clocks, pkgs. - 170 Pumps, pkgs. - 53 Ag.imp., pkgs. - 53 Ag.imp., pkgs. - 130 Revolvers, cse - 1 W. mills.pkgs. - 60 3.376 Brazil, 275 er, bags. 993 Canada.

Tin plate, bxs 250 1,366 Pig iron, tons. 13 197 Sh'tiron,pkgs 40 681 Mach'y, pkge. 2 56 197 681 56 Clocks, cs...
Ag. imp..pkgs
Tacks, cs...
Mf. iron, pkgs
W. mills, pkgs
Nails, bxs... Pasages. Ptlm., gals. 175,713 13,834 London. Ag.imp..pkgs.1116 24,845 Hdw., pkgs... 221 5,502 Clocks, pkgs... 268 4,816 Cartridges, cs. 3 121 S. rollers, cs... 26 962 Nails case Madagasear. lombia. Nails, case ... R. R. cars ... Wringers, cs. . Mach'y, pkgs. Mf. iron, pkgs

Scales. cs. ... W. mills, pkgs Bayonets, cs. Saws, case ... Br. goods, cs. Pumps, pkgs. Zine, eks Glasgow Mach'y pkge. 1 17 Clocks, bxs... 26 435 Ag, imp. pkgs 11 270 Sew. ma.. cs... 11 300 Hdw. pkgs... 29 79 S. rollers, cs... 15 533 Zanc, cas Scales, cs.... Chains and a.. pkgs... Br. g'ds, case. So... Cartridges, cs. W. mills, cs... Pumps pkgs... Pumps, pkgs. Cop. wire, cae Nova Scotia. Ptlm., gals...2527 280

Mf. iron, pkgs. 70 305
Boilers. 3 1,506
Pump. 1 27
Hdw. pkgs. 30 300
Mach'y, pkgs. 3 500
iron safe. 1 30
Leadpipe, box 1 13 Uruguay. Scales, cs.... 10 Ag. imp.,pkgs 30 New Brunswick. Hdw., cs. . . 11 398 Mf. iron, pkgs 4 125 British Guiana.

British West Indies. Fidw., pkgs. 9t 393
Ptlm., gals .17,145 1,815
Scales, cs. 5 10
Sew. ma., cs. 4 117
Lead, pkgs. 13 51
Nails, pkgs. 83 354
Nails, bks. 30 150
Tin, pkgs. 8 218
Yel. metal, cs. 2 141 ML. I'OH, pags 147 14,207

Mach'y, Pags 1,47 14,207

Cuttary, Cs. 58 1,433

Sew. ma., Gs. 175 3,240

Ptlm. gais. 12,500

Car w. and a., pkgs. ... 808 5.730

Locomotive 120,459

Steel Cage 120,459 pkgs.... so8
Locomotive . 1
Steel, case . 1
Nails, cs... 10
Chain, bbl . 2 British Possessions in Africa.
Ptlm., gals. 27,000 3,300

Order, Tin, plates, bxs., Black taggers, bxs.,

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending Moy 8, 1883.

Bremen. Quan. Val. Quan. Val Mach'y, pkgs.

Africa.

Ptlm., gals. 712,853 53,317 Ptlm., gals. 124.430 11,500 British Australia.

Marseilles.

Ptlm., gais, 189, 300 17, 780

Ptlm., gals.rco.sr8 7,600 Seville. Ptlm., gals.183,000 17,19 Genoa.

Ag. imp., pkgs 167 4,100 Sandwich Islands. Locks, pkgs. 29 1,087 Mach'y, pkge. 1 62

Mach'y, pkgs. 26
Pumps, pkgs. 2
Ag, imp, pkgs 7
Spikes, kegs. 151
Mf, cop., case 1
R. R iron, pkgs 13
Hdw., pkgs... 41
W. mills, cs. 8
Cutlery, cs... 2
Tinfoil, cs... 3
Scales, cs... 23
Sew ma., cs... 27
Iron safes... 27 Central America. 65 Argentine Republic. Ptlm.. gals..41,600 5,010 Mf. iron, pkgs 10 195 Hdw., pkgs... 192 4,130 Shoe nails, cs. 40 670 Sew. ma., cs... 65 1,200 Ag. imp..pkgs 184 5,250

Sew. ma., cs., 43 Ptm., gais...181,372 Hdw., pkgs., 413 Mach'y, pkgs., 18 Guns, case....

Ptlm., gals., 25,000 2,875 United States of Us-962 3 16 5 4,925 10 265 43 4,785 4 368 8 231 0 503 3 900 2 17 2 40 8 47 251,695 1 100 lombie.

Mach'y, pkgs. 172
Cutlery, cs... 56
Ptlm., gals... 330
Iron safes... 5
Nails, kegs... 68
Quicksil... dsks 4
Spikes, kegs... 6
H'r'shoes, kgs 27
Firearms, case 1
Boiler... 1
Revolvers, cse 1 503

104

Newfoundland.

Mexico. Maxico.

Hdw., pkgs., 21
Clocks, pkgs., 21
Ag. imp., pkgs 23
Nsli. rppe, pkgs 12
Nslis, keg5. 133
Tacks. cs. 9
Valves, cs. 3
Pumps, pkgs. 11
Firearms, cs. 62
Cartridges, cs 11
W. closets... 64
Revolvers, cse 1
Mf. iron, pkgs. 120
Mach'y, pkgs. 147
Mach'y, pkgs. 147
Mach'y, pkgs. 147 Ptlm., gals...5000 638 Scales, cs... 2 71 Mach'y, pkge. 1 10 Hdw., cs.... 4 59

Nails, kegs... s Mach'y, pkge. 1 37 Sew. ma., cs. 10 253 Wire, coils... 375 3,595 Hdw., pkgs... 74 1,048 20 ma., case 1 Scales, bxgs... 76 Nails, pkgs... 77 Nails, kegs... 100 330 Mf. iron, pkgs. 5 90 Liberia.

Black taggers, 523,

70
Spelter, ingets, 224
Tin, slabs, 3
Tin, ca., 12
Guncape, ca., 16
Guicksilver, bils, 650
Fine metal, pkga, 85

Mails, kega. 150

Japan.

Ptl., gls. 1.09,550 12
Revolvers, cse. 1
Revolvers, cse. 2
Revolvers, cse. 3 Ptl., glv. 1.025,500 108,950 Revolvers, cae 2 75 Val. 11,8-0 176 325 Cartes, cs... 15 14,8-0 176 325 Cartridges, css... 15 14,8-0 176 325 Copper boiler. 1 25 140w... 6 14,8-0 4,1-12 171m, gals, 41,8-0 4,1-12 171m, gals, 41,8-0 4,9-12 1,6-2 175 2,676. COAL.

The Anthracite Coal trade is dull, showing little improvement. No agreement exists beyond the present week in regard to work at the mines, but some of the large companies, whose position as respects running contracts made them comparatively indifferent, are now apprehensive of bad effects should the output be on full time through the rest of the month. Thus far the production is about 1,000,000 tons in excess of last year, and the accumulation is less. At the same time prices are weak, the circulars affording only an approximate range.

Bituminous Coal remains in the same

anomalous position noticed for some months past, with prices at the lowest range.

The Pottsville Miners' Journal says:
"Prices some time ago were forced down to a point that would not permit the sale of Pig Iron except at a loss to the maker. In this condition of the trade there was the choice of three evils—sell at a loss, stop-producing, or stock the product. While-some few chose the first, most of the fur-nacemen made the Iron and stocked it in expectation of a revival. That revival has not yet come and the dilemma is getting troublesome. A great deal of discussion has been had on the subject, and attempts made to devise a plan of relief, but, as is always the case, no plan can be devised that will suit the requirements of every producer." The total Anthracite tonnage reported by

the railroads last week was 704,953 tons, an increase of 317,844 tons, the corresponding week of 1882 being a half-time week, bringing the total of the year to date to 8,643,496 tons, an increase of 990,996.

OLD METALS, PAPER STOCK. &c.

The purchasing prices offered by dealers are as follows: Copper, heavy. Copper Bottoms. Yellow Metal.... .09 Brass, heavy ... Brass, light Composition, heavy Lead, heavy Tea Lead Zinc Pewter, No. Pewter, No. 2. Wrought Iron Light ve Plate The prices current (prices paid by local dealers) for Rags, &c., are as follows:

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements during the past week:

t tree A fa lo in or m be th

to

ne cit

repe

earl

for orde

Price

lows

tion :

2.46: 4.250

Sti

excep uncha sized

conce

ing ra

@ 3.2 Shee

to not

Severa Prices

ever, 1

busined

posed to

immedi to be p sidered

ing pric

Common Common

IMPORTS, For the week ended May 4:

1881, 1882. 1883.
Total.....\$10 605, 80 \$8.001.234 \$7.151.902
Prev. reported...141,813,546 170,885,093 155 279,081 Since Jan. 1. . \$152.419,335 \$178,976,327 \$162,430 983 Included in the imports were articles of merchandise valued as follows:

Pkges. Bronzes.... Chains and anchors.. Clocks.... 3.961 2,505 1,681 Platina.... Plated ware. The quantities of various articles imported

compares with previous dates as follows: For the 18 weeks week. of 1883. tin For the week ended May 5:

Total.
Previously reported..... 20.450
01
87
Total since January 1, 1883.
57
Same time in 1884.
38
Same time in 1886.
99
Same time in 1896.
Same time in 1878.
Same time in 1879.
Same time in 1877.
Same time in 1876.
Same time in 1876.
Same time in 1876.
Same time in 1874.
Same time in 1874. 3.348.448 7.035 811 7.603.690 10.618.664 20.320,789, 30.786.699 16,005,682 19,128.807 14.827,432

EXPORTS EXCLUSIVE OF SPECIE. For the week ended May 8:

78 1882. 1882. 1883. 188

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., t PHILADELPHIA, May 8, 1883

posed to make still further concessions, proposed to make still further concessions, providing such a course seems likely to open up a market. This would not apply in all cases, however; the Thomas, Glendon and Andover companies, for instance, having made reductions of \$2 at a stroke, feel that they have gone far enough, but there are many who would shade the above companies' quotations 50¢ @ \$1 or more ? ton. Hence, as a matter of fact, the market is still drooping and Iron can be bought for less money to-day than it could have been a week ago, or at any other time since August, 1879. is generally supposed that somewhere near bottom has been reached, but the feeling is so uncertain that purchases are confined to lots for immediate delivery, and bids beyond that cannot be had at any reasonable figure. Under such conditions it is impossible to make any confident predictions, unless it be that the market will continue unsatisfactory until some of the surplus stocks are out of the way. This will require considerable time unless more Iron is used or much less Iron made than at the present seems likely. This appears to be the only way out of the difficulty, although there are people who still think that something will turn up to give the market an improving tendency. At the same time the majority of holders would not hesi-tate to shade prices more or less liberally, providing they could meet with good cash buyers. So far as known, no such opportunities have been met with, so that the business of the week has been very much of a retail character, at about the following range of prices for furnace deliveries, say: No. 1 Foundry, \$21 @ \$22; No. 2, \$18.50 @ \$19.50, and Gray Forge, \$17.50 @ \$19. Large lots could be had at less money, but how much less can only be known by parties willing to test the matter by making firm offers.

Bessemer Pig.-No transactions; \$22 asked for summer shipments, with buyers at about half a dollar less.

Spiegeleisen.-Nothing doing; price, \$32 @ \$32.50 asked for 20 %, although there is little doubt that bids at less money would be accepted for a few thousand tons. A sale of 25 % was made to-day at about \$35.

Blooms .- Market very quiet, and in one or two cases lower prices have been accepted for prompt cash. As a rule, the following are fair average quotations, say: Charcoal Blooms, \$60 @ \$62.50; Run-out Anthracite,

\$53 @ \$54; Scrap Blooms, \$46 @ \$48; Northern Ore Blooms, \$45 @ \$46.

Muck Bars.—Demand moderate and prices about steady. Sales at \$34 @ \$35 at mill, according to quantity and quality, the last quotation being rather an outside rate.

Bar Iron - There is a good deal of mo-notony in reporting the Finished Iron trade, the changes having been few and unimpor-tant for many weeks past. As compared with last week, there is absolutely no change whatever; prices are still somewhat irreguar and the demand very unsatisfactory. is the same tenacity in sticking to the old prices on the part of makers of the best Iron, and the same "shopping" around for lower prices, even among buyers of small Neither can we find any change as regards the amount of business, the mills running on hand-to-mouth orders, and keeprunning of mand-own to truets, and seep-ing fairly well employed. At the same time, there is a good deal of anxiety in regard to the future, although not to an extent to cause any change in quotations. At 2.2¢ @ 2.25¢ for Refined Iron, manufacturers are eager for business; at much lower prices they don't want it, although lower prices they don't want it, although in exceptional cases, for a very desirable order, it is barely possible that a tenth might be conceded. Country mills have been shading prices for some time, but their product is not generally regarded as up to the standard when requirements as to quality are very stringent. Store prices are 2.3¢, and for the general run of business at 6.0 at may be convidered fair. ness 2.2¢ @ 2.3¢ may be considered fair has been no definite arrangement made as city quotations. There has been some inquiry for Skelp Iron, and over 1000 tons have been sold in lots, with moderate con-

very little new business during the past out losing money. So far as furnacemen week, so that the market has the same dull are concerned, the sooner this Iron gets into the hands of consumers the better, for reports. A few of the mills are fairly well as long as it is unsold buyers will take employed, while others have scarcely anything on hand, with very little prospect of quote as follows: early improvement. Inquiry has been made for about 1000 tons Bridge Plate, but the order has not been given out, and there is no certainty that it will be at present. Prices are weak and generally quoted as follows, but good buyers can shade prices more or less, according to quantity and specification : Say, Bridge Plate, Tank Iron, &c., 2.4¢; Shell, 3.15¢ @ 3.25¢; Flange, 4.15¢ @ 4.25¢, and Fire-Box, 5¢ @ 5.5¢.

Structural Iron.-There is nothing to report in this department, the market being exceedingly dull and very little inquiry, except for small lots. Prices are nominall anged, but it is understood that good sized orders for Angles can be placed at concessions of about a tenth from the asking rates, which are 2.4¢@ 2.5¢; Tees, 3.15¢@ 3.25¢. Beams and Channels steady at 3.5¢.

Sheet Iron .- There is no special change to notice in this department, except that several offers have been made for large lots. Prices were too far below the market, how-Prices were too lat ever, to meet with takers, so that actual ever, to meet with takers, so that actual for carload lots and upward for carloa sidered advisable to discount the future too comparatively light. It is now certain that heavily. Small lots sell at about the follow- the factories will be continued in full blast ing prices, viz. :

Wrought Iron Pipe .- There is some-the movement is confined in most cases to orders for small quantities. There has been some effort made to stiffen prices, but without any satisfactory result. • We continue former quotations. Boiler Tubes are quoted 55 % @ 57 ½ % off price list and 70 % on Gas and Steam Pipe, with extra discounts on large orders.

Steel Rails .- The market is fairly active and there is considerable inquiry, although buyers appear disposed to hold off for lower prices. A fair average business has been done at about \$38 @ \$39 at mill for Heavy Rails and \$39.50 to \$42.50 for Light Sections, say 40's to 25's. Several orders are held in abeyance for lower prices, \$37 having been bid and refused for one lot. Some talk as low as \$35, but for the time being manufacturers appear to be pretty firm at \$38 as a bottom quotation. Mills moderately full for the summer months, but would not be likely to refuse business from good buyers at \$38 @

Old Rails .- Market very quiet, no sales having been made in this market for several days. There are buyers of foreign T's for mpt shipment at about \$23, but sellers \$23.50 @ \$24. The market is very ask \$23.50 @ \$24. The market is very weak, however, and it is probable that buy ers' terms will have to be accepted in order to do business. Double Heads not offered.

Scrap Iron .- Market dull, weak and lower. Choice qualities of No. 1 Wrought still command pretty full prices, say \$20 @ \$27, but ordinary lots are slow of sale at \$24

Nails-Continue as reported last week, with a fair demand, but prices show no improvement, and \$3.15 % keg is about the usual selling price of small quantities.

PITTSBURGH.

Office of The Iron Age. 77 Fourth Avenue, PITTSBURGH, May 8, 1883.

The important factor in the Iron trade at present—the labor question—still remains unsettled, and the prospect at the present writing is by no means encouraging. As both sides appear determined—the Amalga-mated Association saying that they do not intend to submit to the proposed reduction and the mill owners averring that they will shut down at the close of this month unless the reduction in the price of skilled labor is conceded—a lockout seems almost inevitable. There is no word of either side asking for another conference, and it is not likely any of the various propositions submitted will be agreed to. The result of the contest last year weakened the Amalgamated Association and strengthened the manufacturers, but there does not appear to be any disposi-tion on the part of the latter to take advantage of that victory; they say it is not with them a matter of might, but of right and necessity, and if they cannot get a reduction they must shut down. While a lockout would be a serious blow to general business here in Pittsburgh, there are those who are impressed with the belief that a suspension of the mills for a mouth or two would be the best thing that could happen the Iron trade.

Ore.-The Ore trade continues in same dull and unsettled state chronicled for some time past, and there is not much prospect of any immediate improvement. nacemen in the present condition of the Pig Iron trade are in no mood to buy Ore anything else, and until there is a very radi-cal change in the situation there will be little chance to sell Ore in this market, and the probability is that there will be a considerable reduction in the output of the lake companies this year.

Pig Iron.—The situation remains the same as a week ago; business continues very dull, and consumers, in view of the probabil-ity of a lockout June 1, are buying only as their immediate necessities require. There is no way of disposing of it at present unless the price is put down low enough to tempt cessions on lots of 250 tons and upward. Small lots have been sold at 2.2¢ @ 2.25¢. not likely to be done, as few of the creditors Plate and Tank Iron.—There has been holding it can sell below present prices withery little new business during the past out losing money. So far as furnacemen

denote my v	CALCALD	0						
No. 1 Foun	dry		 		\$21.50	0	22.00, 4	mos.
No. 2 14					20 00 (66	20,50, 4	0.0
Neutral Fo	rge				18.00	(0)	10 00. 4	0.0
Red-Short								6.0
Bessemer.					21.10	(to	22,00, 4	0.0
Cold-Blast								0.0
March	WD	T.		. 1			9 9	

Muck Bar-Is quotable, in the absence of sales, at \$34 @ \$35, 4 mos., according to quality

Manufactured Iron .- Now that there is a probability of a strike, both jobbers and consumers are ordering more freely, and as the mills are refusing to accept orders for delivery beyond this month, the market is considerably stronger. It is doubtful if a large order could now be placed here. The mills, as a rule, have small stocks, and in riew of a stoppage are anxious to husband their resources as much as possible. W now quote on a basis of 2¢ for Bars—that is well assorted orders-with, as already stated, an increasing demand.

Nails .- There is a good demand; manufacturers have all they can do, and prices until the close of the month, as manufacturers are anxious, if possible, to accumulate,

a lockout, and, while firmer, prices as yet are without quotable improvement. Discount on Gas and Steam Pipe 70 and 10 % Tubes, 57½ @ 60 % off regular list. Oil-Well Casing quoted at 50% P foot, net: do. Tubing, 15% @ 10d, net. There is very little done here in Oil-Well Supplies. Nearly all manufactures of the second facturers of these have agents in the oil-producing regions, where nearly all the business is done and prices fixed. A buyer, as a rule, can do much better with the agents than with the manufacturers.

Old Rails .- The market is weak and ower, with liberal offerings for future de-We can report sules of 1000 tons American Tees at \$23.50, and 500 tons closed vesterday at \$23. There is in negotiation a ot of 5000 tons, also for future delivery, at There is in negotiation a \$22.50; spot delivery would probably be worth more, although consumers here are pretty well supplied. A good many railroad companies expect to replace their Old Iron with Steel Rails with a month or two, and they are anxious to dispose of the Old Rails in advance, being apprehensive that possibly prices may go still lower.

Steel Rails.—The mills are pretty well upplied with orders, and the market is uoted steady at \$39 @ \$40, cash, at works, for Heavy Sections. It is evident that the mills will have all they can do this summer, but there is not much of a bonanza in the usiness at the prices.

Steel .- The Merchant Steel trade coninues sluggish for the season and unsatisactory. Orders come forward slowly, and factory. Orders come forward slowly, and desirable ones can be placed considerably under card rates, especially as regards the lower grades of Steel, which are always cut

Railway Track Supplies .- Railway Spikes remain unchanged at 2.60%, 30 days but it is intimated that the price will shortly be 2.50¢. Splice Bars remain unchanged at Track Bolts are still quoted at with Square and 3.35¢ @ 3.40¢ with Hexagon Nuts. If Finished Iron should advance, as it will in the event of a lockout, all kinds of Ratlway Supplies will follow suit.

Crop Ends.-There has not been a single ale reported for several weeks, in the ab-ence of which we continue to quote, nominally, at \$25 @ \$25.50.

Scrap -There is so little doing in any kind of Scrap that it is difficult to give accurate quotations; certain it is prices are weak and in buyers' favor. No. 1 Wrought is quoted at \$23 (@ \$24, net ton, for Ordinary, and \$25 for Selected; Wrought Turnings, \$16 (@ \$18; Old Car Axles, \$33 (@ \$35; Old Car Wheels, nominal, at \$21 (@ \$22, gross; Cast Borings, \$12.50 (@ \$13.50, gross.

Window Glass .- There is an increasing demand, but prices are no better. Single Strength is still quoted at 70 and 5 % discount from regular list in carload lots, and Double Strength at 75 % off.

Coke-Continues backward, as compared with what it usually is at this season of the year, although all that can be expected in view of the depressed condition of the Iron turers, \$1.75 at mills. Prices remain unchanged at \$1.05 ton, free on cars at ovens.

CHICAGO.

Office of The Iron Age, 36 and 38 Clark St., cor. Lake, CHICAGO, May 7, 1883.

Hardware,—Trade during the past week has been fair, while prices remained unchanged.

Nails,-The quotations on Nails, 10d. to od. sizes, are very unsettled in this market, owing to the great amount of cutting being done by jobbers, notwithstanding that stocks are light (some sizes, 8d. and 1od. notably, being almost entirely exhausted) and that the demand continues good. We give as market quotation \$3.25 ? keg for carload and smaller lots.

Manufactured Iron.-The demand for Merchant Iron has been fair. We note change in quotations, as follows: Bar, 2.20¢ @ 2.30¢ rates; Angle Iron, 3¢ @ 3.20¢ rates; T Iron, 4¢ rates; Beams, 3.80¢; Channels, 3¢; Tank Iron, 2.80¢ @ 3¢ rates; Sheet Iron, 3¢ 3.20¢ rates: Norway Original Bars, rates; Norway Re-rolled Bars, 5½¢ rates; Ulster, 4½¢ rates; Low Moor Iron, 8¢ rates; Nuts and Washers, 8¢ off list; Wrought Boat Spikes, 3¢ rates.

Pig Iron.-We have no change to note in this market, with the exception of a slight im-provement in the volume of business transacted during the past week over that of the previous week. Trade, on the whole, however, continues comparatively small, and quotations remain unchanged, as follows: Lake Superior, Nos. 1 and 2, \$23.50; No. 3, \$24, and Nos. 4, 5 and 6, \$25, 4 mos.; Briar Hill, \$25; Silvery Soft, \$23 @ \$24; Crane No. 1, \$27.50; No. 2. \$26.50; Himrod. \$23; Thomas, \$24 @ \$26; American Scotch, \$24 @ \$25; Du Val, No. 1, \$24; No. 2, \$23; Fulton Notch, No. 2, \$22.50; No. 3, \$21.50; Calumet, \$23 @ \$23.50, 4 mos.; Scotch Imported, \$31, and Southern Coke, No. 1, \$23.85; No. 2, \$22.55; Lake Superior, Nos. 1 and 2, \$23.50; No. 3

Steel.-The demand for Agricultural Steels Steel.—The demand for Agricultural Steels during the week past has been quiet, while for Tool and Machinery Steels it was fair. We quote as follows: Tool, 11½¢; Machinery O. H., 5¢; Crucible Machinery, 7¢; Hammer, 2 inches and under, 8¢; over 2 inches, 9¢; Cast Spring, 6¢, and O. H. Spring, Tire and Sleigh Shoe, 5¢; Sheet, first, second and third quality, 12¢, 10½¢ and 8½¢ respectively; Crucible Plow, 6¢; Eagle Plow, 5¢; Iron Center Plow, 9¼¢, and Soft Steel Center Plow, 9¼¢; Cast Plow, 5¢; German Plow, 4½¢. Plow, 5¢; German Plow, 41/2¢.

Scrap Iron.-The Scrap market still con Scrap 1101.—The Scrap market still continues to have a downward tendency. We note a still further decline in quotations on Wrought and Cast Scrap and Plow Steel, which we quote as follows, which are dealers' purchasing prices: No. 1 Railroad Wrought Scrap, 2 net ton, \$21; No. 1 Country Wrought Scrap, 2 net ton, \$21; No. 1 so that in the event of a lockout they will be able, for a time at least, to meet the immediate wants of their customers.

Wrought Scrap, Ponet ton, 18; in the critical condition that the royalty and nobility of France were 95 years ago, the plate Scrap, Pone, 10; Machine Shop illustration goes to show that the common Wrought Turnings, Pone, 19; Cast Iron Pipe, like that for all kinds of Finished Iron, has been stimulated by the probability of a \$12; Malleable Scrap, \$5.

EVERETT & POST, 156 Lake street, Chicago, under date of May 5, 1883, report the Pig Lead market as follows: During the week the Pig Lead market has shown considerable weakness. Opening at 4¼¢, prices have gradually settled down to 4.15¢ under sales of some 900 tons Common and Refined.

The market closes weak and dull—nominally 4186 @ 4.206, according to brand and delivery. The statistical position of Pig Lead is unchanged, stocks in hands of smelters being comparatively light, and in most cases they are sold ahead. The cause of the fall in prices seems to be depression in trade, brought about by lateness of spring, strikes among laborers and consequent stringency of money market.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, May 7, 1883.

General mercantile trade in the South is orisk. The business of the spring season has so far been large and quite satisfactory. weather has been propitious for the growing crops and fruit, and farmers are cheerful and . Prices of heavy manufactures are weak and tend to lower quotations. Consumers hold off the market except to supply imme-diate wants, and stocks in all lines are accumulating. The weather for the week has been warm and showerv.

Pig Iron.-There is nothing new to reort in the Pig-Iron market. The same dull and drooping condition of past weeks contin-ues. One coke stack in Tennessee (Oakdale) has blown out and will be thoroughly overhauled during the summer. Several are out in Alabama, two in Virginia, and more will out before the end of June. We hear of ales of low-grade Forge Iron as low as \$15. Most transactions of any size are a shade below inside quotations. Small lots go at 50% or \$1 below the figures. No. 1 Foundry is in better supply than for some weeks past. We quote: No. 1 Foundry, \$19 @ \$20; No. 2 Foundry, \$18 @ \$19; Gray Forge, \$17 @ cheerful account of the Iron trade, but we are not as those without hope for the future, wheel Metal, \$24 @ \$26.

Ores.—We quote: 50 % Brown Hematite, 2 ton, \$2 @ \$2.75; Red Fossil, \$2 @ \$2.25, elivered at furnace.

Miscellaneous Articles.—Old Rails continue dull and nominal. We quote them at \$23, though concessions would have to be made on that figure to place any large lots. Scraps are very dull and unsought. Wrought Scrap, \$18 @ \$22; Cast Scrap, \$11 @ \$14; Old Wheels noming \$23 Old Wheels, nominal, \$22.

Nails.—The market is very dull and tends buyers are expecting a decline, and are buying only from hand to mouth. We quote for large bills and considerable stocks offer-. We hear of sales of round lots, Wheel-make, in Mississippi River cities and Nashville, at \$2.90 rates. Small lots go at about 10¢ higher than jobbers' bills.

Manufactured Iron .- Bar Iron is dull. We quote large bills \$2.10 and slow sale. Railroad Spikes, \$3.20; Track Bolts, \$3.75; Fish Plate, \$2.50.

Coal.-We quote: Fancy Lump, \$3;

Coke.-We quote: Furnace Coke, \$3 at point of consumption; Foundry, 10¢ @

CLEVELAND.

Rhodes & Co. write as follows under date of the 3d instant:
A careful, dispassionate review of the

month of April cannot fail to present to the impartial observer of the Pig Iron market more dark than bright features. The volume of business has not been as large as in March. Prices have been reduced at least \$1 ton in the East, and have gradually sagged in the West. Prices for a year have been proportionately lower West than East, and the largely advertised reduction of Lehigh Valley Irons has been found necessary to adjust the difference in values between the regions East and West of the mountains. We do not hear of as low sales of Charcoal Iron in the Northwest as we did one month ago, and unquestionably there is a firmer feeling there in Irons for future delivery. This, however, is only a natural reaction from the intensely low and unwarranted prices occasioned by Iron thrown on to the market as a result of the Union Iron and Steel Co. susof the country, but the wide effect this affair has had cannot fail to suggest that it is like "the last straw which broke the camel's lack." The property of a the last straw which broke the camel's back." The prospect of a suspension of work by the Western rolling mills, from a probable disagreement on the scale of labor, to be fixed the first of June, adds very materially rot the glosure cycles. to the gloomy outlook.

To those who believe in our reasoning of

one month ago, more serious we have mentioned is the great damage done to the winter wheat, disclosed by the Agricultural Department report of April 10. The average condition of the crop is 80, as compared with 104 in April, 1882, and 85 in April, 1881. With no improvement later on, this would mean that our total wheat crop would be 50,000,000 to 60,000,000 bushels less than it was last year. Such a shortage would diminish our exports from \$55,000,000 to \$65,000,000, which would be a serious matter in our trade balance. That any estimate form as to the result of this year's crop is liable to be "too previous," we are ready to his before shoe from now to harvest the weather from now to harvest the prospects.

Trade has ruse.

To be to 4% to 1. B b 2% 02 2 3 5 6

To 1. 0 4% 2 11 6 2 2 3 10 6

To 1. 0 4% 2 11 6 2 2 10 6 2 2 10 6

To 2. 10 6 12 6 2 2 10 6

To 2. 10 6 12 6 2 2 10 6

To 2. 10 6 12 6 2 2 10 6

To 2. 10 6 12 6 2 2 10 6

To 2. 10 6 12 6 2 2 1 France destroyed the growing crop and was the immediate cause the next year of the greatest revolution of modern times. While our business interests are far from being in the critical condition that the condition that the

our manufacturing industries have been so highly stimulated for the past four years that we need, more than in ordinary times good weather and good crops. Our financial situation is now so well assured that, w hatpresent season, we need not fear finaucial disaster; but that for any reasonable amount of business activity this summer and fall we need a good return from "old mother Earth" is well recognized and understood. Therefore, as conservatism is properly the order of the day, we need not expect to see men embark in new enterprises, nor producers pile up Pig Iron, until the crop question is pretty well settled.

For the variety of reasons we have enumerated, there is a gradual but steady decline in the production of Pig Iron. There were 55 less furnaces in blast April 1 than January 1, and 82 less than were running April 1, 1882. That Pig Iron is too low in price is readily conceded by the consumer, and could there be an organized effort to curtail the production, the care would be sooner effected than if left to the operation of natural causes. The fact of an over-production is, however widely appreciated, and there is-wisely, we think—a determination on the part of prod-ducers not to accumulate any large stocks. The old Ore is worked up, and the feeling prevails that it is not the correct policy to buy Ore unless the purchaser can sell his prouct at a profit. This cautious and reasonable course will have its effect, and we may confidently expect a happy issue out of our

present troubles.

The sales of Lake Superior Ore for 1883 delivery have been, as nearly as we can learn, about 500,000 tons—the largest portion having been bought by Bessemer Rail mills, who have a large part of their product placed. As the production will not likely exceed 2,000,000 tons, this, considering all the circumstances, is not a bad show for the

and while the Iron outlook is just now deand while the fron outdook is just now decidedly unpromising, we confidently believe that "good growing weather" for the next four months will give us a sufficiently lively business this fall.

LOUISVILLE.

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of May 5, 1883: The market is quiet. Fur-naces are holding for full figures, while

FOUNDRY IRON.	
No. 1 Hanging Rock Charcoal	\$25.00 0 26.00
No. 1 Southern Charcoal No. 1 Hanging Rock Stonecoal and	
Coke	22 00 6 22.50
No 1 Southern Stonecoal and Coke	22.00 96 92.50
No. 2 Southern Stonecoal and Coke	20.50 @ 21.00
"American Scotch"	20.00 (6 21.00
Open Silver-gray	
Close Silver-gray	19.00 @ 19.50
MILL IRONS.	

No. 1 Charcoal.
No. 1 Stonecoal and Coke, Neutral.
No. 2 Stonecoal and Coke, Neutral.
No. 1 Stonecoal and Coke, Cold-short
No. 2 Stonecoal and Coke, Cold short
White and Mottled, Cold-short and 17.00 @ 18.00

CAR WHEEL IRONS. 27.00 (6) 28.00

Central Kentucky, Cold-blast W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, report to us as follows, under date of May 5, 883: Bar Iron.-A marked change has taken place within the past few days. Mills are steadily declining orders, except such as can certainly be executed within the present month. Extreme low prices have disappeared; an advance of \$2 @ \$4 \$2\$ ton is asked. As the probability of a lockout in June increases, buyers are naturally more anxious to provide for future wants, as the lesson of last year is too recent to be for-gotten. There is a large amount of Finished Iron going into consumption constantly, and the stoppage of the mills for two or three weeks causes serious inconvenience. Sheet has felt the influence of the situation more strongly than Bar, and those who did not place their orders in March and April are in result of the Union Iron and Steel Co. suspension. The Marshall failure at Pittsburgh brings to light about 58,000 tons of dead stock, the existence of which was hardly suspected by the trade in general. Fiftyeight thousand tons of metal is only about one month's consumption for the busy workshops of Pittsburgh, and is a mere drop in the busket compared with the total consumption. This has lent a little courage to the holders of stocks, and a much better tone prevails. Building is more active here than for years.

W. N. WYETH, Iron and Steel Merchant, one month ago, more serious than anything 46 and 48 South Charles street, reports us we have mentioned is the great damage the following, under date of May 7, 1883: done to the winter wheat, disclosed by the

July, 1788, a hail storm over Northern France destroyed the growing crop and was the immediate cause the next year of the greatest revolution of modern times. White

	THE REAL PROPERTY AND ADDRESS OF THE PARTY PROPERTY PROPE			
	Iron)	\$25.00 (23	30.00
	Virginia C. B. Wheel Iron	28.60 (10	30,00
	Anthracite, No. 1	23.00 (33	24.100
1	11 No. 2	20.00 (
	" No. 3	18,00	10	19.00
	" Mottled and Write	10.00 6	14	17,00
	Charcoal C. B. Blooms	58.00 (
	Refined Blooms	47.00 €		52,00

CINCINNATI.

May 7, 1883—Pig Iron.—The past week has developed no new features in the market further than that some parties have placed their orders for uses further than their present needs.—While the lower grades of Charcos? Code and Stonecoal cinds are largely in the second standard damand. grades of Charcoss, Love mand Scottons of Charcoss in Security is Consessions of and are being Concrete "we concessions or and are being Concret ... consessions on quoted prices, the best Hanging Rock makes are in very short supply, and are being taken readily at full quotations. Mill Irons are waiting till further developments of the are waiting till further developments of the labor question, to be had about June 1. Quotations for the past week: Best Hanging Rock Charcoal Foundry, \$25 @ \$25.50; Good, \$24.50 @ \$25; Coke, Best, \$23; Good, \$22; No. 2, 502 @ \$1 less. Southern Charcoal Foundry, \$22 @ \$23 for Best No. 1 and \$1 less for No. 2. Coke, Foundry, \$20.50 @ \$21.50. Silver Gray Softeners, No. 1, \$20.50 @ \$21.50. No. 2, \$10.50 @ \$21.50. No. 2, \$10.50 @ \$20.50 @ \$20.50 % \$20.50 @ \$20.50 & \$20.50 @ \$20.50 & \$20.50 \$21.50. Silver Gray Softeners, No. 1, \$20.50 (@\$21.50; No. 2, \$19.50 (@\$20; No. 5, \$19.50 (%\$20; No. 5, \$19.50 (%\$

ST. LOUIS.

HOFFER & Co., Pig Iron and Iron Ore Merchants, 417 Pine street, report to us as follows, under date of May 5, 1883: Trade continues dull and depressed. We quote:

Continues dan and depressed. We quote .
HOT BLAST CHARCOAL IRONS.
Missouri \$21.00 @ 22.00 Southern 22.00 @ 23.00 Ohio 27.00 @ 29.00
COAL AND COKE IRONS.
Missouri 21.00 @ 22.50 Southern 20.00 @ 22.00 Ohio 21.00 @ 26.00
MILL IRONS,
Red Short 19.00 @ 20.00 Neutral 18.00 @ 19.00
CAR WHEEL AND MALLEABLE IRONS.
Missouri 21.00 @ 22.00 Southern 25.00 @ 30.00 Ohio 25.00 @ 35.00
-

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent.) LONDON, ENG., April 23, 1883.

THE IRON MARKET

remains very quiet in all parts of Great Britain. There is a considerable amount of work in hand at all the leading establishments, and the majority of the smaller con-cerns "keep moving," but there is no real activity in the ordinary branches of the trade, and very few persons are at all san-guine as to the course of events in the near On all sides caution is the dominant future. On all sides caution is the dominant idea, the fear that selling values may at any moment undergo some further depreciation being sufficient to make buyers adopt and adhere to a purely hand-to-mouth policy. Nobody is believed to be laying in stock for future consumption, despite the extremely low range of values now current and recover. low range of values now current, and vague reports here and there of forward purchases by very old hands. Consumers have become content, it would seem, to proceed on actual evidence rather than on inference. They perceive that the stocks of crude iron are increasing in many parts of the country, and that there is some difficulty in realizing quotations; hence they believe that they are correct in witholding their orders until such time as they may be ready to work up the iron. In most sorts of manufactured iron the same rule holds good, and is emphasized by the circumstance that at some of the works the make is being lessened, owing to the poverty of the consumptive demand. Again, it is held that the lower figures cabled New York for American iron must have some influence with our ironmasters. inasmuch as it is only by underbidding the United States mills and forges that importers can hope to sell British products at all. Therefore, on the whole, the majority of exporters and consumers are proceeding very cautiously, albeit some of them are not without an eye to the possibilities opened out after the advent of July by your new tariff. A few merchants believe, or say they believe, that we are certain to have a dull market during the next five or six weeks, but they contend that as July draws nigh matters will improve, and may do so with unexpected rapidity. These are do so with unexpected rapidity. These are merely opinions, however, and they do not affect the immediate future, so that for the moment we may take it for granted that our iron market will remain quiet. We may also venture to assume, I think, that in several departments the rate of production will shortly be reduced. As matters now stan prices have reached a level which is critical for many of the smaller producers and for those concerns which are not self-contained
—that is to say, where coal, ironstone and lime, are not near together, or other prime In more than one line essentials missing. there is not room for more than one fair hence the manufacturer who has to buy his coal and pig iron is out of the hunt" in all ordinary cases, and must retire from competition unless he is able to build ap a business in specialties which are out-pide what we may call ordinary work. The with of this statement is self-evident, and further proves the accuracy of the idea that a feetfeelly awayard, period is at hand, for

all the small men.

It is not impossible that other persons some who deem themselves "big fishes". may also be caught and nipped, especially in those cases where the supervision of the monderns is not so direct and personal as it should be. There are rumors that one such neern in North Britain is already feeling the squeeze, and, if report be true, two other undertakings, overloaded with original capital, but not overburdened with good management, are taking in sail prior to the storm they plainly see approaching.

The junctures such as this many of the worst quote: points of the "company" system make themselves apparent. They are often offi-cered by competent men, but their boards of directors are not infrequently quite unac-

quainted with the technical side of the ness, and the manager or managing director is so hampered by routine and formal financing that he is practically handicapped out of the market. In other instances the directors have sufficient sense to leave matters in the hands of their experts, and [thoy do, tell within the limits of the powers they precess, but never achieve a as-spicuous successes. They are mostly over-burdened with capital on which they cannot pay dividends save during periods of abnormal excitement and high prices. They are alleged to compete for orders very often in the most reckless manner, and by private firms are asserted to be the "curs of the iron trade," by reason of their unwieldy production and capital, and the necessity that urges them forward in their rate of make, irrespective of the state of the mar-These allegations may not be wholly ket. but I am afraid they have a substan tial foundation.

IRON AND STEEL PRICES

are so nearly unaltered that I need scarcely are so nearly unaltered that I need scarcely waste your space by giving them afresh, with the usual exceptions to be presently touched upon. In certain sorts of crude irons there has been a decline, while manufactured iron is so largely subject to "special quotations" just now that all open rates must be deemed quite nominal, and, consequently likely to be misleading. The requently, likely to be misleading. The re-striction in the make of finished iron is being tried, but, as it has only been in vogue a fortnight, its results are as yet unrevealed. As you are aware, the restriction in that case amounts to a count of 10 turns per fort-night instead of 11. As the men themselves have promoted the movement, it is not unlikely to be honestly carried out. In South Staffordshire the manufacturers of sheet and galvanized iron are also trying a little half-hearted restriction, but, so far as Intile half-hearted restriction, but, so far as my information goes, they are each and all "waiting to see how the cat jumps," pr.or to pushing the idea to its legitimate issues. In all branches prices are as per your cablegram of date or approximate date. I hear of numerous American "soundings"—mostly deep-sea, with a long line—but of few new commissions on your account. YOUR TARIFF PROBABILITIES

are being keenly discussed, but I am bound to state that I have not come bound to state that I have not come across anything approaching to enthusiasm over the prospects opened out by the new duties. All information on the subject is eagerly perused, and as far as possible assimilated, but the wisdom born of experience renders most of our people anything but sanguine of the probabilities hidden behind July 1, 1383. They are wary, and have such a high opinion of the cuteness of Cousin Jonathan that they will have ocular demonstration previous to placing any faith in the new tariff. Already, ining any faith in the new tariff. Already, in-deed, manufacturers in many branches of the iron and steel trades say they clearly per-ceive that we are not going to benefit by the alterations, and resignedly remark that "it is no use whipping a dead horse." They hold that all the alterations in a downward direction are purposely so made as to afford no possible benefit to European manufac-turers, while in all classes of goods wherein we "had a chance" the duties are so appre-ciated as to close us out more effectually than While these opinions are very general, there are many firms, however, who are determined to try their luck on American soil—some because they believe that their products are good enough to penetrate beyond any duties; others because they once did an American business, and yet others who think they will "look in" on better terms when the new system is inaugurated. Among the last named are the bar-iron, sheet-iron, hoop-iron, wire-rod, steel-rail, galvanized-iron and tin-plate houses. Some of them are doubtful as to the actual duties of them are doubtful as to the actual duties on their particular manufactures—on wire rods, for instance, whether .6 cent or the higher figure—but they are not asleep, and if the thing can be done, I fancy it will not be neglected. This applies, of course, to the German and Belgian as well as to the British manufacturers. In some lines—such as razors—whereon the new duties will be higher than those now in force large and higher than those now in force, large and urgent orders have been sent to our makers, for completion between this and the end of June.

SCOTCH PIG IRON

Friday, April 20, when a sudden spurt place and warrants were run up to the ex tent of 5/ or 6/ P ton. The rise is believed to be due to the movements of speculators in their efforts to cover themselves. Warrants now stand at 47/5 % ton, cash. There has been a further decline in several makers' There are now 113 furnaces (in cluding 7 on hematites) in blast in Scotland, against 108 this date in 1882, while Connal's stores hold 582,246 tons (a decrease on the eek of 656 tons), as compared with 630, 381 Shipments to date this ons a year ago. year have been 164,660 tons, or 4973 tons elow 1882 to same date, while importations from Middlesboro' into Scotland have been 74,451 tons, a decrease of 7236 tons this This traffic is now increasing rather rapidly. Writing from Glasgow, April 20, James Watson & Co. said: "The Scotch iron market has improved this week to 47/6½, cash, after touching 46/9 on Tuesday last the advance being mainly due to speculative buying on the part of merchants in the trade. The shipments for the last two weeks have been large, but the demand for special brands continues quiet. disaboro' market is steady at 40/ % ton. The price of warrants here declined on Mon-day last from 47/1 to 46/10, and on the following forenoon 46/9 was touched, rallying later in the day to 45/10½, cash. On Wednesday business was done from 46/10½ to 47/2, easing off in the afternoon to 47 ton. Yesterday the price recovered from 47/52 & 47/52 131 tons, as compared with 11,694 tons the corresponding week of last year."

						N	0. 1.	No. 3.
G M. B., at	Glasgow						48/5	46 6
Clyde,							51/	49/
Clyde, Cltness,	6.0						63/	54/6
Laugloan.	4.0						63/6	54/6

Gartshe rie, Summerlee, Calder, Carnbroe,	66 66 66		54/6 51/ 51 6
		rdrossan 5:/	49/ 46/6 48/6
Kinneil, at Be	o'ness		56/ 47′ 48/6
	AT	MIDDERSONARO	

matters are a little more hoperur, owing to the opening up of the Northern navigations, and the great increase in the shipments of pig iron during the present month. By the end of April it is anticipated that the shipments will be ahead of last year, and that the reserve stocks will show a decrease. Quotations of pig iron are not materially altered, but there is a somewhat better tone. For No. 3, 40/@ 40/3 is asked, and for G. M. B., f.o.b. makers' wharves on the

No.	Foundry 44/3	Mottled
66	2 "42/3	White
bo .	3 4640/3	Refined Metal56/
10	4 4430/9	Kentledge41/
8.6		Cinder35/
The	stool works are	busy. You may be

Iron and Steel Institute will take place at Middlesboro', where a strong local reception ommittee has been formed.

HEMATITE PIG IRON

weak and without any feature of interest. Stocks are increasing (there are 57,000 tons in the West Cumberland stores alone), but in several quarters preparations are being made put down at 31,000 tons weekly on the West Coast alone. Mixed lots are quoted 51/@ 52/, with only a small sale. Makers' brands are: to limit the output. At present the make is

ale:			
	Ne. 1.	No. 2.	No.
Cleator	56/	55/6	55
Lonsdale	53/6	53/	52
Workington		52/6	52
West Cumberland			
Lowther		52/0	52
Moss Bay			
Distington	53/	52/6	36
Harrington		52/6	52
Solway	53/	52/6	52
Maryport	53/6	53/	52

Ores are 10/@ 13/\$? ton at the mines in Furness or Cumberland. Included in last week's shipments from West Coast ports were 12,812 tons of pig iron and 4969 tons of

steel rails.		
SOME CURRENT PRICES ARE :		
2	8.	d.
Copper sheets, 4 x 4. P ton 73		
Copper sheathing, 2 ton 74		00
Yellow metal sneets, 4 x 4, ? D oo		06
Yellow sheathing, P D	00	0636
Wallaroo copper, V ton 72	00	00
Chili Copper, P ton 63	10	00
Chili Copper, P ton. 63 Best selected ingot, P ton. 70	10	00
Brass wire, P. D	60	07
Copper wire, P D oo	00	9
Composition nails, W D 00	00	734
Copper tubes, P D	0.3	10
Brass tubes, W D	00	0.)
Sheet zinc, best brands, \$\gamma\ ton 18	5	00
Hard spelter, P ton 10	10	00
Hard spelter, special brands, W ton. 11	00	00
Virgin spelter, & ton 15	10	00
Virgin spelter, special brands, 9 ton. 16	00	03
Re-melted spelter, P ton 14	00	co
Straits tin, P ton	10	00
Galvanized sheet iron, 18 & 20 G.,	GU	00
# ton 12	10	00
Galvanized sheet iron, 22 G., P ton 13	5	00
Galvanized sheet iron, 24 G., \$\text{\$\gamma\$} \text{ ton 13} \\ Galvanized sheet iron, 26 G., in felted	10	00
Galvanized sheet iron, 26 G., in felted		
cases, P ton 16	15	00
Gas tubes, black, 723/2 % off list,		1
Gas tubes, gaivanized. 571/2 % off list.		1
Boiler tubes, 60 % off list.	~~	
Quicksilver, & bottle 5 Tin plates, I C coke, & box	10	00
Tin plates, I C coke, tin lined, # box. co	16	00
Tin plates, I C charcoal, & box oo	17	00
Cube nickel, & D	20	6
German silver sheets, & D	3	8
Bright iron wire, No. o to 7, \$\psi\$ ton o	15	00
Feneing wire, o to 6, \$ ton, 9	00	00
Wire nails, o to 7, W cwt 00	9	00
Bamboo steel, % up, W ton 9	35	00
Regulus of antimony, P ton 40	00	00
Crude antimony, \$\mathbb{P} \ton 23	30	00
Lead, L. B. pigs, \$\text{\vec{a}}\ ton	8.5	00
Lead sheets, P tou 14	3	6
Lead pipe, & ton 14	10	00
L ad shot, @ ton 16	2	6
White lead (genuine dry), \$\varphi\$ ton 20	00	00
Red lead (dry), \$\mathbb{H}\$ ton	00	00
Tea lead, \$\partial \text{ton}	IO	00

FOREIGN.

FRANCE.

FRANCE.

(Moniteur des Interets Materiels)

Panis, Apri 23, 1833.—Metals.—There has been a good deal of excitement in general business during the week on account of the Government conversion scheme and the suicide of the leading oil speculator. Metals have been inactive at a decline, except in Tin, which is higher. We quote at the close: Copper.—Chili Bars, 102,50 @ 165 francs W 100 kg; 1 Ingots and Slabs, 172,50; Best Selected, 176,28, and pure Corocoro Ore, 170. Tin.—Bancs, 265; Billiton, 260; Straits and Australian, 28,75. Too kg; Inguis and usual, 173, 200 kg; Inguis and pure Corcoro Ore, 170. Tin.—Banca, 265; Billiton, 260; Straits and Australian, 287, 5, and English, 26,25. Lead, 23,75 & 33,75, and Spelter, 4,025 & 4,075. Lead, 23,75 & 33,75 & 33,75 and Spelter, 4,025 & 4,075. Lead, 23,75 & 33,75 & 33,75 and Spelter, 4,025 & 4,075. Lead, 23,75 & 33

BELGIUM.

(Moniteur Industriel.)

BRUSELS, April 24. 1883.—Iron.—No essential change has occurred in the general situation; the 20,500 tons of old Iron Rails sold by the Government of the following the sold by the Government of the sold by the Government of the sold by the sold by the sold by the sold by the sold between 75 and 85 fraces \$\frac{1}{2}\$ ton, which is a good price; five times as many might have been sold. New orders of importance are still scarce, and the few arriving are the subject of a deal of negotiation ere a sale is effected, but as this is the spring season, minor orders abound, keeping up a moderate amount of activity. Hence, although the situation cannot be called a downight bad one, it certainly is not one to boast of. Fig from has remained steady; English Foundry sells at about 50 frances. At Charleroi Iron is held at 7.45. In spite of English competition, the Luxembourg people firmly adhere to the price of 6.25. Pudding Fig sells on the basis of 6.25 francs \$\frac{1}{2}\$ too kg. Athas-Halanzy remains stiff at 5.75 francs. Merchant Iron has been sustained tolerably well at 15 francs. Common Sheets can barely be quoted 17 \$\frac{1}{2}\$ its francs; No. 3 sells at 20. No. 4 at 28. Commercial at 23 and Thiu at 25. From Chaleroi we are informed that the rolling mills there still complain of a lack of orders, and that dealers awail themselves of this state of affairs for depressing themselves of this state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of the state of affairs for depressing the state of affairs for depressing the state of the state of affairs for depressing the state of affairs for depressi

CHILL.

CHILL.

(Weber & Co.)

Valparaiso, March 5, 1831.—Copper.—The uninterrupted decline in England has depressed prices here very much, 3134 quintals selling at \$18.55, equal to £64 17/6, free on board per steamer to Liverpool. Nitrate has, on the other hand, gone on ingroving, advancing to \$1.50 for 35 And \$2.57\footnote{Comparison}, and \$2.57\footnote{Comparison}, and \$2.57\footnote{Comparison}, and for the price closes at \$2.47\footnote{Comparison}, and for the United States, \$3.00 tons, to the United States, \$3.00 tons for Europe, and \$3.00 for the United States. Coal.—Shipments this way from England being on the decrease, best Steam Coal has risen to \$2\footnote{Coal}, \quad \text{35}\footnote{Coal}, \quad \text{35}\footnote{Coal}, \quad \text{35}\footnote{Coal}, \quad \text{35}\footnote{Coal}, \quad \text{35}\footnote{Coal}, \quad \text{37}\footnote{Coal}, \quad \text{38}\footnote{Coal}, \quad \text{37}\footnote{Coal}, \quad \text{38}\footnote{Coal}, \quad \te

HAMBURO, April 25, 1831.—Iron.—The revival in the Iron trade in Germany cannot yet be called general, yet indications are all favorable, and the immediate future is looked forward to with considerable confidence in our Iron districts. A very active demand has developed for rolling mills produce, so that several abiling mills have tried to screw up prices; this is notably the case in Westphalia. As matters stand, a general advance in prices cannot yet be thought of, but if the improved outlook and reviving demand hold good a little longer, we may expect such a movement, Mean shile Pig Iron does not show much strength. From all we can ascertain, stocks of rolling-mill products are comparatively light in the interior. The quotations at Duss dorf are as follows: Spiegel, 27 marks 7 ton; Gray Pig No. 1, 62; Lux embourg Pig., 44.60 @ 46; Charcoal Pig. 83 @ 85; Foundry No. 1, 75; No. 2, 71, and No. 3, 52 @ 63; English Pig No. 3, at Ruhrort, 62; English Bessemer, at port of shipment, 5; @ 52, and German Bessemer 61 @ 62; Merchant. 142 @ 155; Common Sheets, 190 @ 210, and Thin, 170 @ 180 marks 7 ton. In Silesia prices are not quite so firm as in thenish Westphalia; the only articles in brisk demand there are Beans. Steel works all over Germany are very busy; the Rull rolling mills are loaded down with work. As Pig Iron sells at comparatively low prices, consumers thereof are likely now to step forward and lay in a supply while it is time. Metals have, on the whole, remained dull; Tin has been firmer. We quote: German Lead, 14 @ 14.0 marks 9 okg.; Copper, Drontheim, 73 @ 74; Lake Superior, 60; Electrolytic, 77 @ 78; English, 71 @ 7; Tin, 104 @ 107, and Speller. 16 @ 16.35. Coal.—There being a good demand from all branches of manufacture, business in Coal has been generally brisk in Germany; shipments in all directions are larger than in 1982 and prices stiff.

(Koch & Vlierboom.)

(Koch & Viierboom.)

ROTTERDAM, April 22, 1883.—Tin.—More has been doing at rather firmer figures; this is due to better deliveries in London and lighter shipments thither from the Straits. Banca has been paid these last few days 28.50 @ 58.75 guilders № 50 kg. on the spot, and 50 May delivery; Billiton, spot, 57.75. and deliverable within the coming 30 days, 8.45. At the close, a futher advance can be put on record. Banca, spot, commanding 59, and deliverable from the next sale at 59.50; Billiton, spot, may be quoted 58, and July delivery, 58.50.

EAST INDIES.

COLOMBO, April 4, 1883.— Plumbago.—Nothing has transpired since our last report and quotations are nominal. We quote in rupees, \$\fo\$to output 1, 190 \text{ for rupees, 190 \text{ } 140 \text{ being paid for Ordinary; \$5 \text{ } \text{ } 2-2.50 \text{ for Chips, and \$4 \text{ } \t

NEW PUBLICATIONS.

THE BATTLE OF CONEY ISLAND; OR. FREE TRADE OVERTHROWS. A SCREE OF history written in 1920. By an Eye-Witness. Philadelphia, J. A. Wagenseller; 1883. Price, 50 cents.

In this little work the author seems to have had in mind a purpose not unlike that which prompted a clever English writer to produce "The Battle of Dorking" some years ago. He recognizes danger to the country in the present tendency of Congres-sional legislation, and under the guise of an imaginary history of events beginning in and resulting from the action of the last Congress, in making unwise and unnecessary concessions to the free traders, who maintained an agitation under the guise of revenue referm, he endeavors to accomplish the task of public instruction better than it could be accomplished by essays on economic topics. The trouble begins with the passage by Congress of a bill materially reducing the duties on imports. This is followed by a year of stagnation, disaster and misery for the working classes. Over-importations lead to panic, importation stops and the Treasury collapses. To a bankruptcy, expenditures national national army and navy purposes, life-saving stations, lighthouses and the signal service are stopped, and things go from bad to worse generally. In one of the Western worse generally. In one of the We railroad trains, break open cars and distrib-ute the grain and food destined for export. Resistance by the railroad men infuriates This brings them, and they burn the city. The tariff is restored matters to a crisis. to protection rates, and in a few years things resume a normal aspect. Meanwhile, how-ever, the navy had been reduced to practically nothing, and the army had shrunk to a mere skeleton. The country had no merchant marine, and was thus both defenseless and dependent upon foreign shipping. By this time Great Britain had begun to show symptoms of decline, but was as ugly as ever, and both Germany and France were anxious for a chance to avenge a fancied affront growing out of negotiations relating to the interoceanic canal.

But the war which culminated in the Batthe of Court Libert was not a war with Mexican Republic, set up for herself and was recognized by the United States. A Frenchman became President, and the Government of the peninsula was incited to press a claim for \$10,000,000 against the United States for mahogany alleged to have been unlawfully cut by American citizens. This claim was received with ridicule, and threats to machinery. ing expedition had been organized in Yucatan, and, without notice, a fleet of war vessels heavily manned was sent into the harbor of street.

was in Oregon and the Cabinet were scattered in all directions. It was some time before the machinery of government could be got to work, as telegraph communication was interrupted at many points. As soon as possible an army was improvised out of militia and volunteers, and sent by rail to Mobile, as an attack on that city was expected. Meanwhile the Yucatan fleet had moved northward, and after sinking two American frigates off Hampton Roads, entered the lower New York bay, and landed the fillibustering army on Coney Island, whence it marched toward Brooklyn, its landing being signalized by the destruction of the Brooklyn bridge by dynamite placed under the towers

by traitors in New York.

The kind of a time which followed is very well described, but can be imagined without detailed quotations from the author. It was not long before a volunteer army was raised and equipped, and transported over the East River to "clean out" the invaders. For-River to "clean out" the invaders. Fortunately, the Yucatanites were pretty much
all drunk on wines and liquors stolen from
the Coney Island hotels, and the New York
troops were not long in forcing the enemy
to retreat—valuable and unexpected aid
coming in the shape of a thousand veterans
who had been on a picnic to Newport, and who
arrived in New York just in time to take a
hand in the Brooklyn fight. But the victory
was not final. The enemy retreated under
cover of the guns of the fleet, and the commanding general of the New York troops
having been killed, the forces became demoralized and a regular Bull Run scamper for
Brooklyn followed. A day or two after
word was received that unless a large
sum of money was paid by noon, New York
and Brooklyn would be shelled. This threat
was carried out, with disastrous results,
nearly all the important buildings being destroyed. All that saved the cities from complete destruction was the intervention of
British naval commanders, who stated that
neutral property was being destroyed and British naval commanders, who stated that neutral property was being destroyed, and that the bombardment must cease. The army of invasion then occupied New York. As soon as possible, however, an army of 300,000 men was raised, and a navy was improvised by incasing merchant ships in steel plates. Of course, these forces made short work with the fillibusters, sundry miraculous mechanical devices enabling "Commodore Swank" to destroy the Yucatan ships. The land forces of the enemy were easily dispersed or cap-tured, and Yucatan eventually had to hypothese tured, and Yucatan eventually had to hyp ecate her mahogany forests and mines to the United States in lieu of indemnity.

The story is well told, and is probably no more sensational than such a story needs to be to make it readable. The principal tax on the reader's imagination is in presuming that such a movement as that on the part of Yucatan could be so organized as to take our Government by surprise. The day of surprises in international affairs is long since past. It is also asking too much of the reader to imagine that treasonable co-opera-tion could be so completely organized in our communities without coming to the public notice. We may be as defenseless at the moment as the author infers, but we are not likely to be caught quite so sound asleep as the story assumes.

Bessemen Sterl-Ores and Methods. Compiled and arranged by Thomas W. Fitch. Size, 6 x 3½ inches: 125 pag-s; cloth. Price, §3. Published by Morrison Renshaw, St. Louis, Mo.

A collection of papers on the subjects covered by the title form the different chapters of this volume, which is presented in a very attractive form. Chapter 1 (Ores) in a very attractive form. Chapter I (Ores) contains the latest and very valuable statis contains the latest and very valuable statistics on the iron-ore production of the United States and the principal countries of Europe. The second chapter is devoted to a description of two American steel works—viz., the North Chicago Rolling Mill Co.'s works at Chicago, and the Carnegie Bros. & Co.'s American Steel Works at Pittsburgh. The characteristic features of these essentially. characteristic features of these essentially different plants are well brought out and ably compared. The following chapters contain descriptions of leading English steel works, and a comparison of their methods works, and a comparison of their methods with American practice; also a description of the Belgian works of J. Cockerill & Co.

The volume concludes with an exposition of the principles involved in the basic process, its progress and commercial success, and a description of the works of the Harrison Steel Co. The volume is undoubtedly a very interesting addition to the literature of modern steel preparative. ern steel manufacture

Fast Ocean Voyages,-The steamship Alaska, of the Guion Line, which arrived from Liverpool last week, made the quickest western passage on record, and beat her best previous voyage this way by nearly two hours. The Alaska left Liverpool on April 28, and sailed from Queenstown at 9.30 a. m. on the following day. The wind was a. m. on the following day. The wind was strong and the sea was high during the first day out, but at noon on April 30 the steamship was 450 miles from Queenstswn. The distance traveled each day during the remainder of the voyage was as follows: May 1, 401 miles; 2d, 421; 3d, 419; 4th, 428; 5th, 413; 6th, 312. In latitude 49° 30', and between parallels of longitude 49° 30' and 50°, several large icebergs were passed. It was quite foggy during the last 46 hours of the passage, and the Alaska was obliged to large three times while soundings were being taken. Her corrected time from Queenstown to Sandy Hook was 6 days 23 hours and 48 minutes. Her best previous passage this way was made in 7 days I hour and 50 minutes, but she has made the voyage the other way in 6 days 18 hours and 37 minutes.

The Knowles Steam Pump Works have changed the location of their salesroom from No. 86 Liberty street, New York, to No. 93 on same street—nearly opposite the old Extensive alterations and improvements have been made in the new location, in order to accommodate their business which requires more room and conveniences for exhibiting and handling heavy pumping machinery. The propose to keep in stock enforce it only excited national derision, a more varied assortment of their improved Meanwhile, however, a gigantic fillibuster- steam pumps, air compresssors, vacuum steam pumps, air compresssors, vacuum pumps, &c., than they have ever shown during their 15 years' occupancy of Liberty The manufacturing facilities have Pensacola. The forts were captured, the also been greatly enlarged during the last town destroyed and the fleet put to sea again. Congress was not in session, the President works pumping engines.



STEEL JACK SCREWS.

Steel is Fast Taking the Place of Iron in all Mechanical Tools.

At a slight extra cost it adds largely to the strength and efficiency of Jack Screws. It would be of great benefit to both dealers and consumers, if Steel Screws should at once come into use, as they cost only 10 per cent. more for the same size, and will probably do 50 per cent, more work. We have Steel Screws on hand of most sizes, and will make anything on our list at short notice.

For size and price see our catalogue for 1883, a copy of which will be sent on

MILLERS FALLS CO.,

74 Chambers Street, New York.

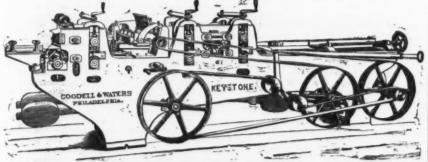
Forged Horse Nails.

MANUFACTURED BY THE NATIONAL HORSE NAIL CO...

Vergennes, Vermont. HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

WAREHOUSE 97 CHAMBERS AND SI READE STREETS. NEW YORK. DURRIE & McCARTY, Sole Agents.

MACHINERY. WOOD-WORKING



Keystone Rapid Feeding Floorer. Machinery for Planing Mills, Railroad Shops, Car Builders, Cabinet, Carriage, Sash, Door and Blind Makers.

SEND FOR NEW CATALOGUE.

GOODELL

WATERS



BOLE MANUFACTURERS OF THE "WEED IMPROVED" BORING FAUCET, For Molasses, Oil, Japan, Varnish, &c.

UNQUESTIONABLY THE BEST

Nos. I, 2 and 3 "King" for FAMILY, RESTAURANT AND HOTEL USE, Send for descriptive circulars. KYSER & REX.

(Variety Iron Works.)

HARDWARE SPECIALTIES, IRON TOYS, NOVEL-TIES AND HOUSE FURNISHING HARDWARE. MAIN OFFICE AND PACTORY:

FRANKFORD, Philadelphia.



II North Fourth St., Philadelphia.



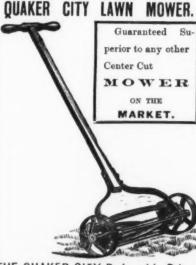
Plainville, Conn.

A. E. DEITZ,



DURRIE & McCARTY, Agents, 97 Chambers & 81 Reade Sts., New York.

F.W. Gallaudet

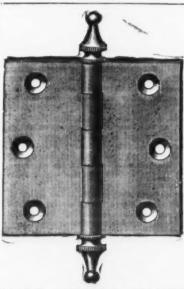


THE QUAKER CITY Reduced in Price. Now, why buy a worthless mower? SEND FOR LIST.

Lloyd, Supplee & Walton, Philadelphia.

DURRIE & McCARTY,

New York.



CAST BRASS BUTT HINGES,

Polished and Plain Finish, Manufactured and kept in stock by W. & J. TIEBOUT.

Manufacturers of BRASS, GALVANIZED & SHIP CHANDLERY

HARDWARE,

Nos. 16 & 18 Chambers St., NEW YORK.

DARLING, BROWN & SHARPE'S Fine Machinists' Tools,

ALWAYS IN STOCK At Manufacturers' Prices. WM. H. BELCHER, 89 Chambers Street, NEW YORK. Catalogues for 1883.

TINIUS OLSEN & CO., STANDARD SCALES AND

esting Machines.

fachines. Tests made daily. Office and Works, N. W. cor. 19th and Buttonwood sts., Philadelphia.

L. COES'

Genuine and Mechanics

PATENT

MANUFACTURED BY

COES & CO., Worcester, Mass.

ESTABLISHED IN 1839.

Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribe cast inside, which strengthen the jaw and give a tuil bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped

L. COES & CO.,

Worcester, Mass.

Warehouse, 97 Chambers and 81 Reade Sts NEW YORK.

DURRIE & McCARTY, Sole Agents.

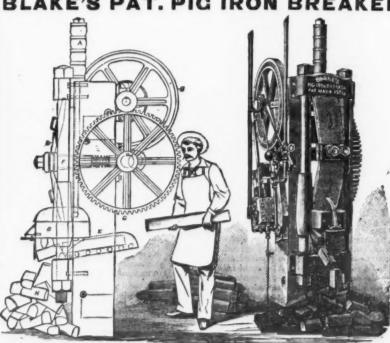


For descriptive catalogue and prices write to

LLOYD, SUPPLEE & WALTON, Philadelphia, DURRIE & McCARTY, New York.
AMES PLOW CO., Boston, Mass.
PRATT & CO., Buffalo, N. Y.
SIMMONS HARDWARE CO., St. Louis, Mo.
HAMILTON & MATTHEWS, Rochester, N. Y.
MARKLEY, ALLING & CO., Chicago, Ill.
HUNTINGTON, HOPKINS & CO., Sacramento and San Francisco. Cal. and San Francisco, Cal.
R. A. CULTER & CO., Peoria, Ill.
DUCHARME, FLETCHER & CO., Detroit, Mich.

LOCKWOOD, VANDOORN & TAYLOR, Cleveland, WM. FRANKFURTH & CO., Milwaukee, Wis. WALTER S. LUDLOW, Cincinnati, Ohio. LLOYD & CLARKE, La Crosse, Wis. H. MITHOFF & CO., Columbus. Ohio, BURROUGH BROS., Kansas City, Mo, THE TODD-DONIGAN IRON CO., Louisville, K. LAYMAN, CAREY & CO., Indianapolis, Ind. 4 THOMAS, PURVEAR& SLOCUMR, Evansville, Ind. A. E. BONESTEEL, Troy, N. Y.

BLAKE'S PAT. PIC IRON BREAKER.



A new and successful machine for breaking pig Iron into any length desired, with rapidity and conomy. Besides saving in cost of breaking by hand, it secures the greatest economy in melting. Several machines already in use. Every machine guaranteed against breakage of parts. Requires but three horse-power. Can be run by beit or have small engine attached. Send for Circulars, Prices, &c.

BLAKE CRUSHER COMPANY.

Sole Makers, 85 Orange Street NEW HAVEN, CONN.



PATENTED

C-SPRING CART CO., RUSHVILLE, IND.

We are making a Sond Cart that is strong, Sight, easy on the horse and rides as easy as a buggy. Easy to get in and out of. Cut shows No. 3, with seat swung back ready to enter. Write for catalogue and prices.

FIRE BRICK,

Gas Retorts, CUPOLA AND FURNACE LININGS,

LOCOMOTIVE TILE,

all kinds Tof Fire Clay Goods and

Double Strength Culvert Pipe. Output for 1882, 30,000 tons. Through care loaded at factory for all accessible points.

EVENS & HOWARD

DIS Market St. ST. LOUIS ME.

.. Send for Prices and Freight Rates.

The Tin-Plate Duty.

The domestic manufacturers of tin plates, black iron and galvanized iron are not at all content to accept without protest the de-cision of Congress respecting the tin-plate duty, and they will make a vigorous effort to change the rate to one which they consider fairly protective. The following circular is fairly protective. The following circular now being distributed all over the country:

NEW YORK, April, 1883. An Important Question for Your Considera-

THE UNITED STATES IRON AND TIN PLATE CO.. DEMMLER, ALLEGHENY CO., PA.

These works were originally erected, at a cost of over \$150,000, to make tin and terne plates and taggers tin, or, in plain English, boxed sheet iron coated with tin, and lead and tin. The company was finally bankrupted by Secretary Fessenden's notorious decision of 1865, admitting these iron products as tin in sheets at 1.1 cents per pound duty, although the act of 1864 distinctly and properly fixed the rate on iron coated with tin to be 2 1/2 cents per pound, same as on sheet iron galvanized or otherwise coated. The American tin-plate industry was thus, either ignorantly or corruptly, throttled at its birth almost, and the American people subjected to a foreign monopoly through governmental discrimination and injustice. Had the duty remained at 21/2 cents per pound, in harmony with the rates on galvanized and on black sheet iron, and with those on all other iron products, it is a well-known fact that the American tin plate business would have pros-pered and grown along with all other branches of iron and steel production.

Americans consume some two-thirds of the British product, and about \$25,000,000 worth are imported annually, causing a tre-mendous needless outflow of gold from the United States. If made in the United States this business would directly support over 300,000 people, and consume annually hundreds of thousands of tons of iron and coal, representing an immense transporta-tion account, and a most valuable demand for other necessaries of life—flour, beef, pork, canned goods, clothing, hardware, &c.—along with the advantage of retaining at home, in active circulation, the \$25,000,000 of increased wealth produced annually from our own soil. The miserable quality of foreign tin and terne plates is notorious, and is eign tin and terne plates is notorious, and is the natural consequence of a foreign monop-oly unchecked by home competition. The too low relative prices of these products cause serious injury to all other branches of the sheet-iron business, both to makers and consumers, The American people do not want tin plates so cheap and mean that they alone cannot be made with American iron and coal by American laboring men in competition. The small proportion of block tin required for coating bright plates is readily obtained, duty free, from the same Australian mines upon which Great Britain depends, and this country is abundantly supplied with lead necessary for coating terns or roofing sheets. The tinning process is neither mysterious nor difficult, and nothing whatever but a fair, equitable rate of duty is necessary to a prompt production by our-selves and others of what are miscalled "tin plates," "terne plates," and "taggers

Notwithstanding these facts, the last Congress, with their one idea of reducing surplus revenues, has practically enacted that no American tin plates shall be made, preferring to listen to the misrepresentations of import-ers, and the mistaken pleas of some influen-tial (but blind and selfish) consumers in the tinware and canning business, who have crippled their home market in grasping for foreign trade, which could more sensibly be held by rebates of duty, if needful, without assisting to continue a mean wrong upon Ameri-can tin-plate makers. The tinware and can-ning interests would be benefited especially by an American production of tin plates—ena-bling them to get exact sizes as wanted, of improved quality, nearer value received, and in having a sure and permanent defense against extortion and the consequences of a foreign war. The new tariff reduces the duty to I cent per pound on sheet iron tinned (tin plates), while fixing 11/2 cents on common plates), while flxing 1½ cents on common black sheets Nos. 25 to 29, and 2½ cents on galvanized of the same gauges. This looks so much like a product of rascality that it is charitable to believe it is the result of ignorance. The tinware and canning interests are beginning to see it was a boomerang victory to them, and that they were duped by foreign agents.

If protective tariffs are justified by the necessity of encouraging the development of important industries, surely every circumstance of the tin-plate situation justified and demanded a re-enactment of at least the rate fixed by the act of 1864—i. e., 2½ cents per pound—to stimulate the investment of capital in this immense business, whereby the American people would be benefited by a home competition, and released from a disgraceful "Cheap John" monopoly, the recognized big fraud of the iron business. Thu is, however, one of the natural consequences of electing so many lawyers into legislative positions—educated men who don't know anything about the inner workings of practical business. When farmers, mechanics, manufacturers, miners, railroad men and producers as a class combine to elect to office practical men from their own ranks, qualified to comprehend and deal with their interests, common sense will be used both in making and in executing laws, and this making and in executing laws, and this country will enjoy the fruits of practical experience, and not before. The question is, therefore, Are you satisfied with this British tin-plate importers' monopoly! If not, please let us know promptly, and sign the inclosed petition to the next Congress for the necessary increase of duty to 21/2 cents per pound. Please also inform your member of Congress, for it is not right that this subject shall rest, with the American people in subjection, humbugged on their own soil by foreign agents, and absolutely dependent on British supplies of an article used in every American household. Meanwhile the tinning department of the United States Iron and Tin Plate Co.'s works must stand idle, and the new company's superior facilities be devoted solely to the production of black sheet iron of the excellent varieties for which they are distinguished. As this is a question of fair

play, we confidently ask for the co-operation of all fair minded men, whether protection-ists, revenue reformers, or free traders.

Awaiting your response, and the signed etition slip, if favorable thereto, we remain, most respectfully,
ELY & WILLIAMS,
New

1781/2 Water street, New York. We also have the following letter addressed to the consuming trades through our col-

To the Editor of The Metal WorkerDEAR SIR: It is evident that manufacturers of iron and steel, and Americans at large, do not com-prehend the extent of the injury inflicted upon them by the low rates of duty collected roducts misnamed "tin plates," "terne lates" and "taggers tin," since Fessenproducts misnamed plates" and "taggers tin," since Fessenden's decision of 1865, admitting them as "tin in sheets," nulifying the act of 1864, which fixed 2½ cents per pound duty on iron coated with tin, &c. This decision not only crushed all chances of an American produc-tion of sheet iron coated with tin or with tin and lead combined, but has prevented a legitimate development of the business in sheet iron, black and galvanized, and their products, because these British products have been used in place of them. The consequences are seen in an immense consump-tion of poisonous, miserably-coated, poor quality British tin and terne plates, which are a practical swindle upon the American people, who are supplied with tinware lowpriced, but almost worthless, with canned goods that are poisonous, and with roofing that rots out from acid under the coating without any delay worth mentioning. Makers of utensils of black and galvanized sheet iron, and of granite ware, &c., are de-prived of a legitimate proportion of the demand, while an innocent public continues to purchase trashy tinware, thinking the arti-

cles are cheap because low-priced.

Meanwhile the American sheet-iron manufacturing business has had an insignificant development, compared with the growth of tin-plate importations. The official record shows this forcibly, as follows: Tin plates, &c., importations, 1882, 439,746,895 pounds = 196,000 gross tons = 220,000 net fons; = 190,000 gross tons = 220,000 net tons; foreign valuations, \$16,550,834; duties at 1.10 cents per pound, \$4,837,216; together, \$21,388,050; add freight, insurance, cost of handling and importers' and jobbers' profits, say, \$5,000,000; apparent wholesale Amer-

ican value, \$26,388,050.

The importers' price of tin and terne plates ranges from about \$6 per box to about \$12 per box at wholesale, and a low estimate of per box at wholesale, and a low estimate the average price obtained would make the fore \$135 per ton, which would make the state of the cost of 220,000 tons imported during 1882, say, \$30,800,000 at wholesale to Americans. Therefore, it would appear either that the foreign shippers and American importers connived together to undervalue the goods about \$4,500,000, or that the American importers have made \$4,500,000 greater profits than the liberal sum allowed. Furthermore, it appears that 439,746,895 pounds, costing abroad, as valued on the invoices furnished to the United States Government, \$16,550,834.64, is equivalent to less than 3.8 ents per pound average value at Liverpool locks, including all the fine grades, extra docks

sizes and shipping charges.

The subject is certainly worthy of a thorough investigation by the United States Government, when it appears probable that this piratical tin-plate business is not only robbing the American manufacturers of black and galvanized sheet iron and of their products, but is also swindling the American people with fraudulent materials. It is not believed that foreign makers actually delivered their tinned sheet iron and sheet steel, tinned for stamping purposes, at an average price of about 334 cents per pound during 1882. In any event, the American iron and steel business suffers from the importation, at unfair rates of duty, of products which represent an annual consumption of over 300,000 tons of pig iron and over 1,500,000 tons of coal, and it is sure that the placing of a legitimate duty of 2½ to 3 cents per pound would revive the iron business materially, and be in all other respects a

real blessing to the American people.

Notwithstanding these facts the new tariff act fixes the duty at I cent per pound. practically prohibits American production and forces the United States to continue in absolute dependence upon British sup-plies of articles used in every American household, subject to continual impositions, and to the serious consequences of a foreign war. Shall this monstrous wrong continue Plate Association" is being formed, and that send their names promptly to either of the following gentlemen:
P. H. LAUFMAN, of Laufman & Co., Apollo,

ALFRED MARSHALL, of Marshall Bros. & Philadelphia, Pa.
C. CRONEMEYER, of U. S. I. & T. P.

New York's Commerce.

Co., Pittsburgh, Pa.

The annual report of the Chamber of Commerce for the year ending May I has been issued. It is a comprehensive document, reviewing in detail the commercial and financial history of the twelve-month, with special reports of the condition of the several trades, statistical tables of all trans-actions in each, tables of exports and imports, and an account of all matters of legislation bearing upon commercial or mercantile affairs

An interesting fact mentioned as to the sugar trade is that the total consumption of that the national prosperity reached its hight in the year 1881, since which we have stead-1882, 1,100,000 tons—an increase of 70,000 ily held our own, and by the natural development of the country grown to the full New York received 586,000 tons in 1882, measure of what was supposed to be an un-New York received 586,000 tons in 1882, measure of what was supposed to be an unagainst 566,000 in 1881, and distributed for reasonable and insecure expansion. The home consumption 577,000 tons. Of the im-year 1882 was a year of rest, but the indica-portation of foreign sugars New York had 586,000 tons of a total at all ports of 879,000 tons—66½ per cent of the whole. Nevertheless, and although the large stocks for the feedings are reading June 30, 1583—show an the refiners are carried here, the distribution from New York has fallen off, while Boston dise, and a balance of trade of \$89,000,000 in

several cargoes from the Sandwich Islands under the provisions of the reciprocity treaty with that Kingdom, under which sugar is admitted free of duty in United States ports. Quite an excitement has arisen on this subject, it seeming monstrous to a certain class of economists that man should be permitted to eat, drink or wear anything without paying something for the privilege beyond the producing cost. On the basis of a population of 53,000,000 the United States have consumed per capita 45.25 pounds, taking rank after Great Britain, which consumed 64.96 pounds. But it must be remembered o4.90 pounds. But it must be remembered in all such estimates that in foreign countries sugar is a necessity, while in the United States no single article of food can be considered as indispensable in the domestic economy. Sugar is relatively cheap, but when it rises in price its use as a luxury off immediately in the United States. tunately for mankind, the increasing numper of fruit-preserving establishments are by its use saving a large amount of perish able food and converting it at small additional cost into a more durable supply.

As to the coffee trade, the report says: The chief feature has been overproduction. Supplies have continually poured in, far beyond the demand, largely increased though it has been by the falling off in price. Under these conditions the trade has been, or course, unsatisfactory to all concerned in it. Moreover, there has been a radical change in its methods; old channels having been abandoned for new to such an extent that a new era is said to have commenced in the trade. By the increased facilities in communication and transportation the foreign factor has en brought into close relation with the jobber, without the intervention of the commission merchant on the seaboard. The in creased distribution of roasted coffee has produced a great change in the general course of business. But in these changes it is no-ticeable that New York has been a gainer. The bulk of the increase in consumption has been taken from this port. At present she holds the control of the markets of the United States, which consume one-fifth of the entire supply of the world, and she bids fair to become the controlling coffee mart. The general features of the trade in tea have not been unlike that in coffee. The entire course of the business has been changed. The bankers extend facilities to the jobbers, who now make direct purchases at the ports of supply. In this multiplicity in transactions it is extremely difficult for the large importer to form any sure judgment as to the quantities or qualities which may come forward, and the course of the market is full of surprises. In 1880 the large importers, who had never favored the disposal of teas at auction, gave their support to a new auction-room. In 1881 the brokers formed an auctioneer association, and new plans are on foot for still further modification. These attempts at change show the unsatisfactory nature of the trade in its present form."

AN UNSATISFACTORY POINT.

In these annual reviews of the progression of the commerce of the United States the one unsatisfactory point is, says the report, the decay of our commercial marine and the passage of our once large carrying trade into foreign hands. Among other instructive statistics under this head it appears that the total number of vessels which entered in the foreign trade of the United States in 1862 foreign hands. was 21,243, an aggregate tonnage of 7,362,-963 tons. Of these 10,805 were American, with a tonnage of 5,117,685. In 1882 the sum total had risen to 33,739 vessels, of 17,600,737 tons, of which 9072 were Ameriean, of 3,340,968 tons.

THE SILVER QUESTION.

Discussing the silver coinage, the report says: "It would be difficult to find in the annals of financial legislation a more peculiar and unfortunate act than that part of the law passed in February, 1878, compelling the purchase of silver bullion by the United States Treasury, and its coinage by the mints in silver dollars of 412½ grains standard weight, at the rate of \$2,000,000 monthly. In the first place, it took no account of the increased production of silver, the diminishing production of gold, and the consequent rapid divergence of silver from standard value; in the second, of the wen-known fact that no country has succeeded in main taining as large a silver coin as the dollar in extensive circulation, and, thirdly, its failure, by concomitant legislation, to make a place for silver in the circulating medium by the withdrawal of bills under \$5, both from the national bank circulation and the Govwere carefully set forward in the memorial those desiring to become members should adopted by the chamber. The practical send their names promptly to either of the 3 th of September, 1878, there were in the United States Treasury (in round numbers) 12,000,000 of standard dollars; on the 31st of October, 1882, there were 93,000,000. Congress showed its pewer to legislate this amount of silver into the Treasury, but it own no fiancial ability to legislate i out of the Treasury into circulation. So long as there is no scarcity of legal tenders, either of the true substance, gold, or of its paper equivalent, either in fact or law, it may be accepted as a certainty that no sub stance which requires a horse and cart to effect its legal tender, in even moderate sums, will ever be in special favor."

THE COMMERCIAL OUTLOOK.

The report closes as follows: "Whoever has taken the pains to follow the course of importation and exportation for three years, note the fluctuation in the shiftances of trade, and the consequent ebb from New York has fallen off, while Boston dise, and a balance of trade of \$89,000,000 in and Philadelphia have each gained, both in receipts and distribution. The one new feature in the trade, the report says, "has been the direct importation at New York of nearly balanced each other, the exports be-

ing \$19,000,000 and the imports \$18,000,000. From this it appears that we shall this year again hold our entire product of the precious metals. If the decrease in importation of merchandise continues, there will no doubt be some importation of coin, which, in view of the fact that the United States has absorbed nearly the entire production of the precious metals of the world for several years, is to be regretted. 'Non nobis nati solum' is the liberal motto of our Chamber of Commerce. There is no selfishness in the broad spirit of international commerce. The health of the whole depends upon that of its parts. The prosperity of the producer and the consumer are indissolubly bourd together. In surveying our own horizon of commercial enterprise we fail to discern one cloud of menace, and look forward with cheerful confidence to a year of quiet prosperity for the entire country, of which New York will, as in the past, receive her ample share."

The Economical Utilization of Coal.

Within the last twenty years, says the English Mechanic, a great change has been effected in the methods of utilizing coal for manufacturing purposes, and the improvements that have been successfully carried out are an earnest of the economies which will ultimately be introduced. Prof. Stanley Jevons' famous prediction is already found to be discounted—though a time must arrive when it will cease to be prefitable to work our coal fields—for a ton of coal now goes much further than it did when his essay was written, and products of its combustion and distillation, formerly little more than waste substances, are now, thanks to the progress of science, of very great value. During the scare in the gas interest, when the electric light, in its modern development, first created alarm in the breasts of shareholders. shrewd investors in that business advised their friends to "hold on," for, as they said, "gas" cannot be so very bad an in-vestment when it costs us practically nothing to make—which is actually true, for the sale of the residuals pays all the expenses of manufacture, and leaves the gas to pay for the charges of distribution and collection. Coke has always had a definite value; but it is not so many years ago that a barge-load of tar could be had for a nominal sum, and ammoniacal liquor was a drug, while gas-lime was freely given to all who would kindly cart it away. Nowadays, thanks to the decart it away. Nowadays, thanks to the unvelopment of electricity, even the scurf from the retorts is commercially valuable, and there is little, if any, waste at a well-conducted gas works. The Siemens regenerated coal in tive furnace did much to economize coal in the metallurgical industries, and lately en-deavors have been made, not merely to utilize the heat of the gases escaping from blast furnaces and coke ovens, but also to seize upon those constituents of the coal which, in the crude form of tar and ammoniacal liquor, are the raw materials of flourishing industries.

The average quantity of coal imported

into London every year probably exceeds 10,000,000 tons, and with the exception of the comparatively small portion which is used in gas works, the whole of the volatile constituents are not merely lost, but are permitted to defile the atmosphere. For the purposes of calculation, it is usual to repre-sent each ton of coal distilled in the retorts as producing 10 gallons of tar, ammonia equivalent to 20 pounds of the sulphate, and 10,000 feet of gas. Taking the loss of the tar and ammonia at average prices, the annual waste going on in London alone is equal to about £2,000,000, while if the value of the gas allowed to escape is reckoned at 6d. per 1000 feet, and a note is made of the inconveniences and expenses which accompany the smoke and soot, the annual loss becomes enormous. Speaking generally, Mr. Jameson calculates that of the 150,000,ooo tons of ceal annually raised in this country, the tar of about 100,000,000 is practically wasted and converted into noxious fumes, while, at the same time, ammonia equivalent to 1,000,000 tons of the sulphate is destroyed. The aggregate loss is therefore immense. Dr. Siemens has, it will be remembered, proposed a remedy—vis., to distill the coal as is done at a gas works, and then to consume the gas and coke separately, while condensing the volatile products—but there are obvious difficulties in the way of while condensing the volatile products—but there are obvious difficulties in the way of introducing the practice, especially to domestic purposes, and there are also mechanical obstacles, which might, however, be removed as experience is gained. In some blast furnaces in Scotland the volatile products of combustion are removed with considerable profit, by causing the intensely-heated gases of the lower part of the furnace to permeate the mass of raw coal in the upper part, thus distilling off, without decomposing, the tar and ammonia, which the upper part, thus distilling off, without decomposing, the tar and ammonia, which are subsequently recovered by cooling the escaping gas. This latter process is the drawback, for the cooling of the immense volume of carbonic oxide and acid together with the nitrogen involves reheating of the mixed gas if it is to be consumed. The process, however, as carried out, is a commercial success, and will probably be adopted elsewhere, even if the utilization of the waste heat has to be abandoned, for the tar and ammonia are, apparently, worth recovering wherever by any not too costly means the products of combustion of coal can be seized nd dealt with.

For very many years the practice of coking coal for metallurgical purposes was car-ried on without an attempt being made to seize upon the tar and ammonia, though some efforts, successful in the main, have been made to utilize the waste heat. The object of the coke-maker is the purification of the fuel primarily, but he also aims to condense it into as small a bulk as possible, for oven tinuing the high heat for close on 100 hours the resulting product becomes hard and com-pact, and consequently a greater weight can be placed in a cupola or a furnace at one charge. In ordinary coking ovens the cardestroyed or escape—the coal losing about 30 per cent. in weight, and gaining about one-fourth in bulk. From good coal, properly washed, the yield may, however, reach as

much as 75 per cent. of compact and practically pure coke. Latterly, many patents have been taken out and considerable sums of money expended in endeavors to recover the products of the coke ovens, but very little has been attempted, and still less ac-complished, until recently. The processes adopted are (1) the subjecting of the coal to a high heat applied to a close oven, so as to bring about a sort of distillation, and (2) the introduction of a flame of gas and air into the upper part of a close oven. The former process is that adepted by Messrs. Pease, with latterly, it is said, very good results, but there is obviously a considerable loss whenever it is necessary to pass a large quantity of intense heat through fire-clay or brickwork, for, to mention only one-but an all-sufficient-reason, it is clear that the outside of a close oven must be hotter than the

inside, or no heat will be transmitted.

To manufacture good coke an intense heat is necessary, and it follows that the wear and tear will be great. To obtain the largest yield of coke and products, however, a close oven seems absolutely. a close oven seems absolutely necessary, and, all things considered, it is probable that the best results are found in the case of close ovens where means are provided for utilizing the waste heat escaping from the flue. In the second process a very intense heat is produced in the oven itself by injecting gas and air into the top, the operation of coking is shortened, and a large quantity of tar products and ammonia is recovered. But where intense heat is required, carbon is cheaper than hydrogen, and more effective, for it requires less air (and consequently inert nitrogen) for its combustion, and does not proproduce water-vapor. Theoretically, the use of the hydrocarbon gases in heating the coke is not sound economy, and facts support the theory, for both Mr. Pattinson and Mr. I. L. Bell have found no difference in percentage yield of coke from ovens burning all their products and those from which the gas and products are extracted. The method of burning the surface coal to obtain the requi-site heat for coking the remainder of the charge also disposes of the layer which in gas-fired ovens is of inferior quality to that gas-fired ovens is of inferior quality to that produced by a higher heat at a later stage. The process introduced by Mr. J. Jameson utilizes the ordinary "beehive" oven, which is charged, ignited and to all appearance allowed to burn in the ordinary way, but near the center of the bottom is a pipe, to which suction is applied. The object of that will be readily apparent. The upper surface will be readily apparent. The upper surface of the coal in the oven being raised to a state of incandescence, the coal beneath is in a state of ebullition, and from the whole thickness gas is endeavoring to make its escape. Like the carbonic acid in the baking loaf, it tends to make the whole mass spongy by forcing an outlet upward; hence Mr. Jame-son withdraws the gases from the bottom of the oven, and the weight of the mass tends to consolidate the coke, which would otherwise be porous. The tar, oil and ammonia are collected in a wet scrubber and condensed in large mains, but by tapping the condenser at various points strong and weak ammoniacal fiquors can be separated as desired, while the oils can also be taken out at once in different qualities—some as clear as amber, others rich in solid paraffine.

This part of the process is, nowever, in its infancy, as is also that portion which deals with the gas which is not rich in hydrocar-bons, but is well suited for use in engines. Those might be located near the ovens and a nose might be located near the ovens and drive dynamos, transmitting electric energy where it could be utilized, provided it is possible to do that economically. Another use has been found for the gas, however, for it contains some carbon, and if, while still in a heated state, it is made to pass into an incandescent over in which the process of cabin descent oven, in which the process of coking is complete, the carbon will be deposited in the cinder, while the hydrogen can be seized and utilized. This method of depositing car-bon from the hydrocarbons is extensively practiced in the manufacture of the filaments for incandescent lamps, and in some experi-ments made with common gas coke the de-posit of carbon rendered the soft and porous lumps extremely dense and hard. With one kind of small coal (an unwashed steam coal) as much as 17.78 pounds of sulphate of ammonia and 9.28 gallons of oil per ton, together with a soke of fair quality, were obtained—results which, if they can be secured in regular working, will be sufficient

TRADE PUBLICATIONS.

The Southwark Foundry and Machine Co.,

of Philadelphia, are just issuing a catalogue descriptive of the Porter-Allen steam engine, which, even in these days of sumptuous cata-logue work, is decidedly remarkable. It is 7 x 10 1/2 inches in size, and contains 54 pages in addition to those devoted to cuts, diagrams, &c. The descriptive matter was prepared by Mr. Charles T. Porter, and the engravings are throughout remarkably fine, especially those that combine the sectional with perspective views. In these the amount of artistic and mechanical skill displayed is of artistic and mechanical skill displayed is very great, and the engraver and draftsman have both performed their work in a most satisfactory manner. The paper is heavy and the printing superb. Tissue paper is used to protect the diagrams that are on a black ground, and it may be said, as an illusthinto as small a bulk as possible, 20.

coke is a different thing to the cinder known black ground, and it may be said, as an interest work, that these grounds are as black as printer's ink can ground are as black as printer's ink can be them. Yet there is no trace of smut, or make them, yet there is no trace of smut, or of "offset," or of overloading the type with ink, even where they come in the same form as the type. As a treatise upon the Porter-Allen engine in all its details, the buretted and sulphuretted hydrogens are work is one that must be considered stand-consumed, while the ammonia and tar are ard, and will find a permanent place on

CAST EBROSN & TOOL

MANUFACTURERS OF

عنه PLAIN LEATHER, FANCY LEATHEP, NICKELED CHAIN,



GILT CHAIN, CELLULOID. ENGLISH

> UHAIN, EMBOSSED. PLUSH,

ALSO,

DOG MUZZLES, ROLLER SKATES, &c.

HEADQUARTERS OF

C. S. OSBORNE & CO'S CELEBRATED TOOLS, BARNEY & BERRY'S SKATES,

CHICOPEE AUTOMATIC DRILL.

114 Chambers Street,

NEW YORK.



PATENTED December 27th, 1831.

Steel Scraper

The Lightest and Strongest Scraper made. The body is made of one single piece of steel. The Handles are fastened inside of fold, and free from all obstructions. The body, bail and runner are all made of steel. Especially suited for contractors. Send for circulars, Manufactured by

THE YORK MFG. CO., Limited, Portsmouth, Ohio.

PHILADELPHIA SCREW CO., Limited. Twelfth and Buttonwood Streets, PHILADELPHIA.

Manufacturers of



IRON & BRASS WOOD SCREWS.

Quality, finish and tests as to strength guaranteed equal to any in the market.

With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts. A full line in stock.

MANUFACTURING CO.,

Unionville, Conn., U. S. A.



BEST PORCELAIN-LINED LEMON SQUEEZERS COMMON SENSE" MOUSE TRAPS, MALLETS, BOOT JACKS, ROSEWOOD FAUCETS, &c. Fine Wood Turning a Specialty. U. S. MINERAL WOOL CO.,



J. STEVENS & CO.,

Chicopee Falls, Mass., P. O. Box 224, Manufacturers of

Spring Calipers and Dividers.

Also, Surtace Gauges and Counter Sinks, Stevens' Patent Breech-Loading Sporting Rifles, double and single barrel; Shot Guns, Pocket Rifles, Pocket Pistols, and the noted Hunters' Pet Rifles. Our

SHOOTING GALLERY RIFLE

Is the favorite everywhere.

SEND FOR ILLUTRATED CATALOGUE.



This is a practical and thoroughly successful SHAKING GRATE BAR. Has been in use over five years, and in many of the largest manufactories in the country. Simple in construction, practive and effectual in its operation, easily worked (being operated in sections in wide easily worked (keing operated in sections in wide furnaces, given over sixty ser cent. All Nur-face, very durable, interchangeable, and can be put in any furnace without delay or change of any kind Descriptive circular, price, etc., sent on application

AETNA GRATE BAR COMPANY, GEORGE H. CLARKE, Manager.
RICHARD THOMPSON, Agent, 110 Liberty St.,
New York.



Cheaper, stronger, and less liable to get out of repair than tin. Any mechanic can apply it. Sample Circular and Price List free by mail at request. Also, Agents for LOWE'S METALLIC PAINT Best and Cheapest. Manufacturers Pritz Pates Rein Helders and Davis Mock Drill Machines.

FERSON Forge and Foundry, JEFFERSON IRON WORKS.

Office and Works. C. B. DOTY, Vice-President.

W. H. WALLACE, President.

CHAMPION FORCE PUMP.

Vacuum Chamber and Air Chamber, PRODUCING

A CONTINUOUS FLOW OF WATER,

Both in Suction and Discharge, AND THEREFORE

WORKS SMOOTHER AND EASIER

THAN ANY OTHER FORCE PUMP IN THE MARKET. HAR

mless Drawn Brass Cylinders and No Stuffing Boxes.

ever Freezes in Winter, and is Not Liable to Get Out of Order.

With hose attachment it is valuable as a fire protection, and for sprinking lawns, gardens, &c. It is light, neat, and easy to handle, and yet strong, substantial and durable, and is adapted to all kinds of wells, dug, drilled or driven.

Send for descriptive circula
and price list.

CLARK BROS. BELMONT, N. Y., U. S. A.,

SOLE MANUFACTURERS.

IN FLOORS AND WALLS OF ',

FACTORIES,

STORES,

*AND DWELLINGS.

By the Fire-Proof Material Called Mineral Wool.

The POOREST CONDUCTOR of heat yet offered. CHEAP and DURABLE. Sample and circular free by mail.

22 Cortlandt St., New York,

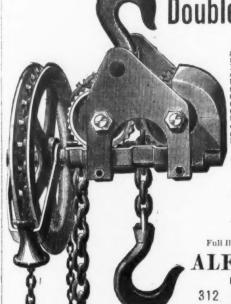
THE DETROIT LUBRICATOR CO.'S LUBRICATOR CUPS,



for oiling valves and cyl inders of steam engines by the only perfect method, through the steam pipe. The oil passes in sight, drop by drop, into the column of steam, where it vapor

DETROIT LUBRICATOR CO. Umce, 129 GRISWOLD ST., Detroit, Mich. Mention The Iron Ag





STEUBENVILLE, OHIO. GEO. P. HARDEN, Secretary BOX'S PATENT Double Screw Hoists.

The unbounded reputation these Hoists have gained for themselves the last four years has no equal. There are now over 7000 in use, Large manufacturers have duplicated their orders a dozen times over. They are in use by all city departments, railroad companies, the United States Government, the English Government, the French Government, the Chinese Government, and in Russia, Germany, Chili, Brazil, Venezuela and Cuba. They have been awarded three silver medals and five diplomas. One trial will convince you they are the best in every particular. Sizes, 500 lbs. to 40,000.

Superior Hand and Power Traveling Cranes, from 1 to 40 tons.

Elevators for Heavy Work, 1 to 10 tons capacity.

Radial Drills of the Most Improved Kind. Full Illustrated Circulars on application.

ALFRED BOX & CO.,

Northern Liberty Works, 314 and 316 GREEN STREET, PHILADELPHIA, PA.

Nos. 20 to 26 Main St., CARPENTERSVILLE, KANE CO., ILL., MANUFACTURERS OF

THIMBLE SKEINS, JACK SCREWS, SAD IRONS, COPYING PRESSES and STANDS, &c.



CKSMITHS'

AND ALL KINDS OF BLACKSMITHS' TOOLS.

SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FRÉEZERS.



83.75 to 82

HAND OR POWER White Mountain Freezer Co.

Nashua, N. H., U. S. A.

PRIZE MEDALLISTS.

Exhibitions of 1862, 1865, 1867, 1872, 1873, and only Award and Medal for Noiseless Steel Shutters at Philadelphia 1876, Paris 1878, and Melbourne 1881. CLARK, BUNNETT & CO., Limited, Late CLARK & COMPANY,

SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

Noiseless, Self-Coiling, Revolving Steel Shutters. Fire and Burglar Proof. Also, improved Rolling Wood Suutters of various kinds, and Patent Metallic Venetian Blinds.

Office and Manufactory, - - 162 & 164 West 27th Street, New York.



Merrill Brothers.

26 First Street,

BROOKLYN, N. Y.

STEPHENS PATENT

For Sale by the Trade.

Office 41 De Street New York U. S. A. ROOFING COMPANY

GARRY IRON IRON ROOFING, Crimped and Corrugated Siding Iron Tile or Shingle, Fire-Proof Doors, Shutters

IRON ORE PAINT AND CEMENT. 152-158 MERWIN STREET, CLEVELAND, O.

Send for Circular and Pric List No. 8. HAMMERS,

FORGINGS and POWER PRESSES.

hese days of fine catalogues as did the orignal. The Southwark Foundry, in sending
as this catalogue, gives us some facts in regard to the working of the foundry and the
mediate prospects of resumin
and the indications are that
content will be taken up. The shops, as
eme of our readers know, have been intion ore from Escanaba to Ci
measure with this could be a large of the contracts on hand.
If you have extension and in addition ore from Escanaba to Ci
measure with this could be a large of the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that the contracts on hand.
If you have large of the foundry and the indications are that you have large of the foundry and the indications are that you have large of the foundry and the indications are that you have large of the foundry and the indications are that you have been inthe foundry and the indications are that you have been inthe foundry and the indications are the properties of the foundry and the indications are that you have been inthe foundry and the indications are the properties of the foundry and the indications are that you have been inthe foundry and the indications are that you have been inthe foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications are the properties of the foundry and the indications creased by a large extension, and, in addi-sion to the manufacture of the Porter-Allen engine, the works are taking up as specialties by draulic machinery, steam pumps, passenger elevators, water-works and pumping engines. They still have under way a large number of heavy Porter-Allen engines for number of heavy Porter-Allen engines for rolling mills. Among these are two 40 x 60, one 44 x 66, a 44 x 48 and a 22 x 36. Most of the principal mills in the country already have one or more of these engines at work. The system that it has been possible to introduce at the Southwark Foundry for the manufacture of these engines has reduced their cost considerably, even on the smaller issee and it is now found that for power on sizes, and it is now found that for power on sizes less than 250 horse-power a Porter-Allen engine is quite as cheap, if not cheaper, than other first-class engines. At this day little need be said in regard to high-speed engines and their value. The public have long ago been entirely convinced on that point, and speeds have increased to such an enormous extent that the Porter-Allen engine is now merely classed as belonging among the high-speed engines, enthusiastic builders having long ago doubled and even trebled those considered economical by Mr. Perter. As a record of experience, the catalogue will be found valuable by engineers experience. everywhere.

Testing Machines.

Riehlé Brothers, Philadelphia, Pa., have sent us a catalogue of their testing machines. It contains a list of all the varieties of testing machines, whether for tensile or transverse strains—wire, spring, cloth, twine, paper or grain—which this firm make. There are also some illustrations showing the forms which they consider proper for specimens to be tested. There are three pages devoted to the usual tables of the properties of sub-stances and metals, the weight and strength of round rope, hemp, wire, &c.

Marshall & Co.'s Affairs.

Messrs. Wm. Yagle, George B. Hill and N. M. Thomas, the appraisers appointed in the matter of the voluntary assignment of James Marshall & Co. to George I. Whitney, have presented their report. Below is given have presented their report. Below is given a table of assets, including pig iron held by creditors to secure payment of various sums of money, stocks hypothecated, and other property unattached by creditors. The value of the latter is \$32,781.47. The stocks, perhaps without any exception, were advanced by the estate, which is an important and interesting for considering the presting and interesting fact, considering the question of the liability of the estate for the debts of the firm. The first column of the table contains the names of creditors, the second the amount of pig iron held as collateral, and the third the nominal indebtedness. With statements the following table will explain itself :

Tons iron.

Creditor.	Tons iron,	Amount
A. Speer	467	\$9,356.50
T. Mellon & Sons	68rg	119,320.00
Allegheny National Ba	ink 1088	35,400,00
Third National Bank .	9330	41,300.00
Braddock National Bar	nk 903	15,140.00
Semple & Thompson	1190	31,100.00
Pittsburgh Bank for Sa	vings. 6x2	10,270.00
Commercial National	Bank, sos	7,600.00
Metropolitan National	Bank, 1119	19,000.00
Tradesman's National	Bank 1161	21,000.00
Citizens' National Banl	K 3601	61,022.00
First National Bank	Con-	
nellsville	378	4,5:0,00
Favette County	595	9,400,00
Fayette County First National Bank, I	Pitts-	
burgh First National Bank,	Bir-	#9,500.00
mingual		10,000.00
Penn Bank	8as	15,440.00
Samuel Hagiett, Wasi	hing-	-5744
ton, Pa	463	7,400,000
Iron City National Ban	k 3886	71,373.00
Thompson, Bell & Co.	961	5,500.00
Coliner & Mart n	¥474	96,739.00
Caughey & Robinson	905	34,179 00
Robinson Bros	305	3,300.00
Mechanizs' National Ba	ink., 1570	25,728.00
Goo J. Gorman	585	10,950.00
Becond National Bank.	323	5,500-00
Odd Fellows' Savings B	lank, 2704	62,984.00
Bank of Pittsburgh	3101	5,500.00
Pittsburgh National Bar	nk of	
Oommerce	1034	30,756.00
People's Savings Bank.	3933	93,228.00
Union Insurance Co	270	4,000.00
"Citizens' Insurance Co.	1433	25,800.00
Pittsburgh Insurance C	0 1348	23,800.00
Diamond National Bani	E 1502	24,970.00
Diamond National Bani German National Bani Allegheny	k of	48,330.00
Union National Bank	705	15,000.00
In addition to the above	there are in stor	. 3100000
age 428 tons of pig iro Machinery and stock a	n valued at	6,150.00
Co's foundry		21,481.47
Book Accounts		19,000.00
	ATED STOCES.	
as a shares capital sto- Co. hypothecated w Bank, Second Nation gheny, First Nations Citizens Insurance Co debts aggregating. Soe shares stock of M Coke Co., hypothecs Henderson, Second? Allegheny, and Thom	ith Odd Fellows' al Bauk, of Allegheny, al, of Allegheny, and to secure ansfield Coal and tted with B. H. National Bank of	74,294.00
to segure		20,000,00

surance Co., to secure

so thares stock of Second National Bank
of Allegheny, hypothecated with J. N.
Davidson, to secure

stoaces Pittsburgh Tool Co. stock, hypothecated with Thompson, Bell & Co.,
to secure. to secure

145 shares Liggett Spring and Axle Co., hypothecated with Farmers' Deposis National Bank, to secure

One-sixth interest in the New Castle Water Co., pledged to Geo. I. Whitney, to secure payment of Depression in Iron-Ore Freights .-

Auegneny, and Thompson, Bell & Co., to secure.

So shares Farmers' Deposit National Bank stock, hypoth-cated with the American Bank, B. H. Henderson, Second National Bank, of Allegheny, Thompson, Bell & Co., First National Bank of Allegheny, to secure debts negregating.

4 shares of Monongahela Water Co. stock, hypothecated with Pittsburgh Bank for Savings and Pittsburgh Insurance Co., to secure.

is sue deserves almost as high praise even in hese days of fine catalogues as did the originarily one half—are out of blast, with no immediate prospects of resuming operations, and the indications are that a number of others will shut down as soon as they have filled the contracts on hand. The rates on iron cre from Escanaba to Cleveland have been made at \$1, and it is doubtful if they will go any higher this season. As this rate only corresponds with a rate of 2½ cents per bushel on corn from Chicago to Buffalo, carriers will prefer entering the grain trade and accept the 3½ cents now offered by ship-

INDUSTRIAL ITEMS.

VERMONT.

The St. Albans Iron and Steel Works have filed a petition of insolvency. The schedule filed shows liabilities of \$50,000 and assets of \$497,000. A meeting will be held on May 11 to choose an assignee.

MASSACHUSETTS.

Mr. Laroy S. Starrett, manufacturer of a combined tool embodying the features of a try-square, T-square, bevel, &c., reports a prosperous trade. By a decision of Judge Lowell, of the Circuit Court of the United States for the District of Massachusetts, handed down January 31 last, competing manufacturers who had been making a simi-lar article were declared infringers upon the patents of Mr. Starrett and were enjoined. This decision sustained both the original patent and the reissues, and places Mr. Starrett's business upon a substantial basis, leav-ing no doubts in the minds of the trade as to his rights.

The Douglas Ax Works, at East Douglas are to shut down to take account of stock. It is expected that the company will start up their new shop at Gilboa after they take account of stock.

The Parlor Grate Co., at South Carver, are putting a new 60-horse-power engine inte

The Colby Iron Furnaces, at Lanesboro, are in full blast again. There is a large stock of coal and ore on hand, and some large orders to fill.

The Barre Plating Co. have just been established at Barre.

CONNECTICUT.

It is reported that the stock of the Companion Sewing Machine Co., at New Britain, is likely to be all subscribed for, and that the company will soon be in operation. The capital stock is \$85,000, of which \$50,000 is open for subscription.

The Pratt & Whitney Co., New Haven, have just completed for a sewing-machine company a machine that wi'l turn out needles for \$20 per thousand where the company been paying \$60 per thousand.

On the 2d instant the wire rope of the elevator at the Burden blast furnace, at Troy, broke, and while a dozen men on the top floor were endeavoring to raise the car, an iron eye to which the tackle was attached gave way. Edward McCabe and William Scott were caught by the rope and hurled down the elevator shaft, a distance of 60 feet. McCabe died shortly after the accident. Scott is dangerously injured.

The firm of E. Lyon & Co., the wellknown manufacturers of hydraulic jacks, punches and shears, has been changed to Watson & S:illman, owing to the sudden demise of Mr. E. Lyon. The new firm will continue the manufacture of goods of which they have made a specialty for so many years, at the old stand, No. 470 Grand street, New York City.

The Ely Hoe and Fork Co., of St. Johnsbury, Vt., have been looking about for a site upon which to remove their works. They have made inquiries in regard to the natural facilities of Newcastle for such a purpose, and their investigation has proved so satisfactory that they have agreed to re-move to that place if the citizens will sub-scribe to the capital stock to a moderate

The outlook is reported to be improving in

McClure & Co., of Pittsburgh, are operating the Rising Sun Coke Works of the bank-rupt Markle firm.

James Hooven & Son, of Norristown, have blown out their furnace at that place, which has been blowing since November last cause assigned is the dullness of the iron

The works of the Altoona Iron Co. are in

The Pennsylvania Nut and Bolt Works, at Lebanon, are doing a good business, and are still adding machinery to their plant as fast as it can be obtained. They employ about 150 hands, but expect to increase to 300 as soon as they get all their machinery in.

The Tanite Co., of Stroudsburg, will exhibit at the Chicago Railway Exposition a new machine for grinding car-journal brasses. The capacity of the machine is 600 brasses per day. The company also manufacture a machine for grinding locomotive tate to contribute to make up the required slide bearings.

The Grant Furnace, of Ironton, made her The prospects of a remunerative season for last blast with charcoal during the past Wood, on Bedloe's Island. This fortification ressels engaged in the iron-ore trade are, year, blowing out in February. Workmen is a star fort, which was built in 1814. The

The Akron Mfg. Co. report a much better business this season than last, but find it more backward on account of the lateness of the season. They are working up a good run for their new specialty, the Universal fence-wire stretcher.

It is stated that a large proportion of the creditors of Brown, Bonnell & Co. have signed the agreement to place the works in the hands of a Cleveland syndicate, and that the change will shortly take place.

The committee in charge of the affairs of the new glass works to be erected at Barnesville have called for 10 per cent. of the subscription to the stock. Work is being

The Akron Polishing and Plating Works esumed operations about the 1st of April, having been quiet on account of Taplin, Rice & Co.'s strike. They are having a good run in stove work and general jobbing. The prospect for the season is considered good.

It is reported that endeavors are being made to induce the Portsmouth Iron and Steel Co. to remove their works to some other city. Steps are being taken by the citizens of Portsmouth to offer sufficient inducements to retain the works.

The new blooming mill of the Cleveland Rolling Mill Co. started up last Monday. VIRGINIA.

The old Elizabeth Furnace, in Shenandoah County, which was destroyed by Sheridan in 1865, has been purchased by Northern capitalists, and is to be immediately rebuilt and put into blast with charcoal. There are some 1200 acres of land connected with the plant, well timbered, and much of it containing the state of hazarite iron. deposits of hematite iron ore.

MISSOURI.

The Excelsior Mfg. Co. are turning out a daily production of 225 stoves, the greater er of which go into stock.

W. D. Marshall & Co. are literally running over with work. Among other orders which are now receiving their attention is one from a new sand company, recently organized, for a new sand boat, two engines, hoisting gear, buckets, &c., and one each for special machinery or apparatus from the Southern White Lead Co. and the Laclede Fire Brick Co. They are also putting up a novel kind of hemp-cleaning machine for a party in Louisiana.—St. Louis Age of Steel.

The capital stock of the Conrad Siebel Copper and Sheet Iron Co. has recently been increased to \$25,000.

The Dixon Fire Clay Co., of St. Louis, have bought out those parties who had control of the mining and washing of their clays. Through injudicious selection and bad management in preparation, and not from any inherent defects in the clays, several complaints had reached the firm, and they de-cided to take the whole thing into their own hands. They now mine, wash, prepare and ship the clay themselves, and confidently assure the trade that they can furnish the most superior quality of both washed and crude clay—as good as ever left the State of Missouri

The Medart Patent Pulley Co., of St. Louis, inform us that the pulley made by them is not of the same style as that turned out in England, the latter resembling it only in the fact that it has a wrought-iron rim. The other parts, however, and the process of making the pulleys, are quite different. The popularity of the above company's pulleys is well shown by the fact that they are now turning out some 250 per day.

ILLINOIS.

Every department of the Crane Bros. Mfg. Co., Chicago, is being run to its full capacity. Their pipe mill is being operated day and night, turning out lap-welded boiler tubes and pipes, while the machinery department is taxed to its utmost to complete a large number of freight and passenger elevators and ice machines.

The McCormick Harvesting Machine Co., of Chicago, are getting out an order of 100 machines to go to Buenos Ayres, South America, and are opening up an extensive trade in the Argentine Republic. The grain crop having materially improved in Russia, the company have just received a cable message for a lot of their machines, although they shipped extensively to that point last

winter.
The Chicago Screw Co., Chicago, will build an addition of 90 x 70 feet, and five stories, to their works.

Bartholdi's Liberty.

The new mills of the United States Iron and Tin Plate Co., of Pittsburgh, at Demmler station, on the B. and O. R. R., are nearing completion, and will be in operation in a short time. It is about four months since the establishment was burned down.

Gen. Charles P. Stone, the engineer in charge, began excavating on Wednesday for the foundation of the pedestal upon which the statue of "Liberty Enlightening the World" is to stand. A satisfactory basis the establishment was burned down. which to lay the concrete. The examina-tion of the ground was begun last month, and two shafts were sunk to discover of what the under stratum consisted. The pedestal will be completed next summer, and the following fall will see the statue in place. In speaking of the work, General Stone said operation again after their labor difficulties. he did not, as an engineer, think that it would be safe to put up such a mass of ma-sonry, intended to stand so long, in one There would be a cessation of work during the winter months, to allow the masonry to settle. The work was expected to endure for a long period, and he certainly proposed to make the pedestal enduring. Measures had been taken to secure the amount. In France the subscription was in francs and half-francs, and he would like to see the people here follow this example. The excavation will be begun in the center of Fort verses engaged in the iron-ore trade are, just now, not very encouraging. The low scale of rates offered by shippers at the opening has dropped still lower, and there is but little demand for vessels. "This state of affairs," says the Chicago Tribune, "arises from the depressed condition of the iron-ore trade and the fast that a large number of mills have been shut down during the winter.

year, blowing out in February. Workmen is a star fort, which was built in 1814. The ramparts are of blocks of gneiss, well laid, which will be allowed to remain. The excavation will be 64 feet square, will extend to a depth of 15 feet, and will occupy a good share of the little parade-ground. This hole was the ramparts are of blocks of gneiss, well laid, which will be allowed to remain. The excavation will be 64 feet square, will extend to a depth of 15 feet, and will occupy a good share of the little parade-ground. This hole was built in 1814. The ramparts are of blocks of gneiss, well laid, which will be allowed to remain. The excavation will be 64 feet square, will extend to a depth of 15 feet, and will occupy a good share of the little parade-ground. This hole was built in 1814. The ramparts are of blocks of gneiss, well laid, which will be allowed to remain. The excavation will be 64 feet square, will extend to a depth of 15 feet, and will occupy a good share of the little parade-ground. This hole was built in 1814.

will rise to a hight of 150 feet, will taper off until at the top it will be 40 feet square. When the statue, 148 feet high, is placed on the pedestal, its greatest altitude will be 300 feet. The walls of the fort making a girdle in the shape of a star will not detract from the pedestal, but add to it. At a distance it

will appear as a part of it.

The Hon. William M. Evarts, Chairman of the Statue Committee, said last night that \$100,000 had been raised, and the remainder would come from the people. "I never had any doubt about the money," he said. The committee propose to commence an active campaign to raise funds. Complete draw-ings of the statue and the interior supports have been received from Bartholdi. statue is being put together as the work progresses, to see that the joints fit; screws instead of rivets are used to hold the parts in place. It will require something like four months to take the statue apart again. It will be ready, it is expected, to send to this country in October or November.

LATE PUBLICATIONS.

Smith.—Cutting Tools Worked by Hand and Machine.-By Robert H. Smith; 14 folding plates and 51 illustrations, 224 pages, 16mo, cloth. London, 1883 - \$1.50

The avowed object of the author of this book is to guide the mechanical ctudent, so that he may judge whether a tool be good or bad, and also to enable him to design new tools scientifically. With the exception of screwcutting tools and files, all the important tools and machines for wood and metal are treated upon including chiesls, hand and machine. apon, including chisels, hand and machine lanes, saws, lathes and machines for boring, drilling, punching, shearing, &c. There are also many valuable suggestions showing the possibilities of making improvements in cut-The mechanic and machinist ting tools. will find this little book of great practical value

Colyer.—Pumps and Pumping Ma-chinery. By F. Colyer, C. E.; 23 folding plates, 8vo, cloth; 1883...\$5

In this work the most approved kinds o ifting, force and air pumps are described and illustrated. Pumping engines and details of pumping machinery are also thoroughly considered. To civil engineers the book will afford much practical information in specifying for this class of work, as the book contains numerous tables and data. contains numerous tables and data, verified in great part from the personal ex-perience of the author, and therefore reliable. Perry. - Practical Mechanics. By

John Perry, M. E.; 148 illustrations, 271 pages, 12mo, cloth. London, 1883. \$1.50

This book is a well-arranged explanation of the principles of mechanics, and to under stand and comprehend its contents requires no more scientific knowledge than any intel-ligent mechanic should have. The work is designed for the use of those who are not trained mathematical students. The author is clear and concise in his statements and illustrations, and the whole subject is treated in a satisfactory manner.

Campin.—Details of Machinery. By Francis Campin, C. E.; 54 illustrations, 270 pages. (Weale's series.) London, 1883 . \$1.40 \$1.40

This is a collection of rules to enable drafts men and engineers to design and construct certain classes of machinery which may be needed to produce certain results. Practical and simple methods are given for computing and estimating the strains that occur in the different details of machines and structures. It is safe to say that by these rules an answer may be found to almost any question that can arise in the machine shop or foundry as to the form and arrangement of machinery. The book will repay a careful

Sent postpaid on receipt of price by

DAVID WILLIAMS, Publisher and Bookseller, 83 Reade St., NEW YORK.

The Common Sense Sash Holder and Lock Combined.

Patented March 6th, 1883.



I am the sole own erof this patent, and sole manufactures of these fasteners and all persons are hereby notified of this fact. Any parties infringing will be dealt with according to law. Far buying and selling the "Practical Fastener," so-called, will do well to heed the warning. Order

H. A. WILLES,

MANUFACTURER AND DEALER IN HARD-WARE SPECIALTIES.

727 Market Street, PHILADELPHIA, PA.



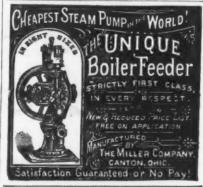
GEO. M. EDDY & CO. Manufacturers of

Measuring Tapes Of Cotton, Linen & Steel.

ALL PURPOSES. 351 to 353 Classon Ave. Brooking N. Y

The only adjustable wire cloth sieve made. It will take out good seeds from refuse of wind mills that c nnot be cleaned by any other process. Can be adjusted to many different-sised and shaped meshes. It will separate the sisse and for all purposes. No. 1 will separate of the sisse and for all purposes. No. 2 will separate of the sisse and for all purposes. No. 2 will separate wheat from Eye, C ckie and Cheat, No. 3 for Peas and Beans and C rm. No. 4 for Onlon Setis. Price, \$2.25 to \$2.50. C ank and power machines, made with Adjustable S eves four to ten feet long, will clean and grade from in to a hundred bushels of seed or grain per hour nore perfectly than any other mill or machine made, because the meshes of the sleves can be adjusted to any size desired. The following prominent seedmen endorse our Blove: B. K. Bills & Sons, ew York; D. Is andreit & Sons, Philadelphia; Hesry A. Dreer, bliadelphia; Herry A. Dreer, bliadelphia; Herry A. Dreer, bliadelphia; Herry A. Dreer, bliadelphia; Herry M. McCullough's Sons, Cincinnari, Ohlo; and by U. B. Agricultural Department, Washington, D. C.

MADE ONLY BY MILTON SIEVE CO., Limited, Milton, Pa."



LAWN MOWERS/HAND **MOWERS** CUARANTEED BEST & CHEAPEST LARGE REDUCTION HORSE MOWERS CHADBORN & COLDWELL MANUF'G CO. NEWBURGH, N. Y.

PORTABLE HOIST.



Warranted double the power and not one-half the price of other hoisters. As a proof of the above, it give them so days on trial. Send for catalogue and price list.

J. DUNN.

32 Bank st., Oleveland, Ohio.

SMITH'S NEW MODEL REVOLVERS.



OTIS A. SMITH, Manufacturer, Rockfall, Ct.

Manufactured only by CONCORD AXLE CO., D. ARTHUR BROWN, Treasurer FISHERVILLE (CONCORD), N. H.

HOOSIER SAW WORKS. W. B. BARRY Saw Manufacturer

132 & 134



Indianapolis, Ind. wages, Gummers, Files, Belting & Emery Wheels.

ALL WORK FULLY WARRANTED, BARNES'

W. F. & JOHN BARNES, Rockford, III



Hoag's Hand Corn, Bean and Beet Planter. Discounts to the trade. Seng for illustrated circulars. A. HoAG, Grand [sle, Yt. For N. Y., Pa. and Canada, to S. GORDON, Charr, Clinton Co., N. Y.

B. BURBANK & CO., the only present Miners and Shippers of

FLUOR SPAR, EVANSVILLE, IND.

Patent Cround

and

Patent

ichardson's

THE IMPROVED CUMMER AUTOMATIC ENGINE.



We have made the Inventing and Manufacturing of this class of Machinery

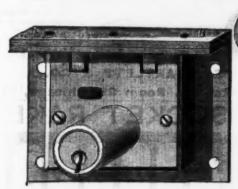
SPECIALTY

for eight years, and have the Largest and Best Facilities of any Manufactory in the country.

Will be pleased to give Estimates on receipt of Sample Barb.

FREEPORT. ILL. THE

CHARLES PARKER





Hill, Clarke & Co., Boston, Mass.,

CABINET LOCKS

BARN DOOR Terry's Wrought Iron HANGER & RAIL



Will not break; cannot get off the track; snow, ice, or chaff cannot lodge on the Rail; will not warp or decay.



Improved over Last Year

OUR NEW JOINT, With Devetail Lap, as here shown, we guarantee to hold 1000 Pounds Weight. if properly put up, and to be the BEST Rail on the market.



TERRY MFG. CO.,

HORSEHEADS, N. Y.

DISC ENGINE.



BEST PROPELLER ENGINE IN THE WORLD

> FOR YACHTS, TUGS and LAUNCHES. ALSO INVALUABLE FOR Dynamo Electric Machines, High Speed Machinery, And Elevator Uses.

WRITE FOR CATALOGUE TO

COLT'S PAT. FIRE ARMS CO., Hartford, Conn., Or to LEONARD & McCOY, 118 Liberty St., New York.



to the Jacob Haish Wire rence are the public as the best deries in the world for stretching wire fences. Every stretch public as the best deries in the world for sample and price list. Liberal discount to jobbers, ot work or no sale, sent for sample and price list. Liberal discount to jobbers.



O,

RIEHLE BROS.

PHILADELPHIA, 4th St., ab. Chestnut. NEW YORK, 115 Liberty Street. ST. LOUIS, 609 North Third St. NEW ORLEANS,

143 Grayler Street.

RICHARDSON'S ONE OR TWO MAN CROSS-CUT SAW,

WITH PATENT ADJUSTABLE HANDLE.

The Improved Handle can be used upright, at either end of the Saw, as shown in the cut, or inclined in either direction. Richardson's Trade-Mark, a Maltese Cross, with the letters B E S T. emblematical of the standing of the Saws in the trade.

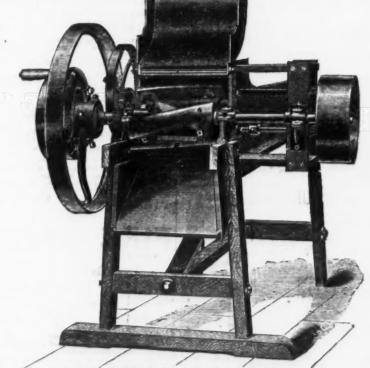
Saws. Cross-Cut and Circular, Compass, 1 Back, Butchers'. Panel, Rip,

RICHARDSON WORKS, 15 to 27 RIVER STREET Newark, N. J., U. S. A. MORRILL'S PERFECT SAW SETS AND BENCH STOP.



price lists ASA FARR

64 College Place, NEW YORK. DIXON'S



ROSS LITTLE GIANT Nº 13. ROSS ENSILAGE AND FODDER CUTTERS, Giants and Little Giants.

THE VERY BEST CUTTERS IN THE MARKET. GUARANTEED TO GIVE PERFECT SATISFACTION. Our 1883 Cutters are the finest we have ever produced. A liberal discount to the trade. Write for prices and illustrated circular.

E. W. ROSS & CO., Fulton, Oswego Co., N. Y.



Pulverizes everything—hard, soft, sticky, and gummy. Grain, Druga, Chemicals, Clay, Gusco, Cotton Seed, Bark, &c., &c. A wonderful ma-chine for grinding Corn, Oats, Faed, &c. Also Steam Engines, Boilers, &c., at lowest rates.

34 CORTLANDT STREET,

NEW YORK.

BOILER, TANK AND BRIDGE. STANDARD_RIVET_CO., Cleveland, Ohio.

Graphite Paint

Before painting either Wood or Metal Surfaces, Roofs, Buildings, Bridges, etc., etc., examine the merits of this

JOS. DIXON CRUCIBLE CO. Jersey City, N. J., U. S. A



VULCAN BOILER WORKS.



Dynamite, Nitro Glycerine, BLASTING MATERIALS.

Contrac's Taken for Clearing Lands of Stumps.

THE HERCULES POWDER COMPANY Cincinnati, Ohio,



Issues Policies of Insurance after a careful Inspection of the Boilers COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

TEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of Steam Boilers. Full information concerning the plan of the Company's operations can be obtained at the COMPANY'S OFFICE, HARTFORD, CONN.,

or at any agency. J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. Pierce, Sec.

Board of Directors.

M. ALIEN, President.

M. ALIEN, Vice-President.

M. ALIEN, President.

M. ALIEN, Pre

FACING CO. AMERICAN

WHITEHEAD BROTHERS'

And Supplies of all Kinds.

BITUMINOUS OR SEA COAL, LEHIGH, CHARCOAL, SOAPSTONE, INDIA SILVER AND GERMAN LEADS, &c.

XX MINERAL FOR HEAVY WORK.

X MINERAL FOR MEDIUM AND LIGHT WORK.

Our fine Facing known, as WHITEHEAD'S STOVE PLATE FACING, is the best

ALSO DEALERS IN

Fire Sand, Fire Clay and Kaolin.

We give special attention to the selection of Albany and Crescent Sands for Stove Plate and Ornamental Iron and Brass Castings.

WM. WHITEHEAD, Treas.,

515 and 517 West 15th St., New York City













WIRE COODS OF ALL KINDS, Wrought-nen fencing, Cresting and Hardware Specialties.









The annexed cut shows one of the many styles of Coffee

our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER Will roast 30 to 49 lbs at once and can be used as a stove at other imes. Send for descriptive list to Manufacturers.

LANE BROS., Poughkeepsie, N. Y.

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York carry a full line of our goods, and will be pleased to serve you at factory prices

SPENCER & UNDERHILL,

94 Chambers Street, New York,

DEPOT FOR

RUSSELL JENNINGS' AUGER BITS

Also RICHARDSON BROS. SAWS.

Germantown Tool Works' Warrantee Hammers and Hatchets, (Stamped Sen. Selson & Ou). (Stamped tee). Selsor & Ow).
Collier's Son s Awls.
American Screws Co.'s Wood, Machine and Rall Screws,
Stove and Tire Bolts, Rivers, &c.
O. Arnes & Son's Shovels, Spades and Scoops
E. W. Galmare & Co.'s Strap and T Hinges.

W. & S. Butcher's Chisels, Plane Irons, &c. A. Field & Sons' Tacks, Brads, Nalls, &c. Brade's Brick Trowels G. F. Warner & Co.'s Carriage Clamps. Nicholson File Co.'s Files.

GENERAL HARDWARE.

B. KREISCHER & SONS,

FIRE BRICK.

BEST AND CHEAPEST.

Established 1845. Office, foot of Houston Street, East River. NEW YORK.

NEWTON & CO., MANUFACTURERS OF BEST QUALIT

FIRE BRICK STOVE LININGS

English, Scotch and Weish

FIRE BRICKS Dinas and Silica Bricks

S. A. RIMINGTON, and 42 Broadway, New York. Yard foot of 4th St., Hoboken, N. J.

M. D. VALENTINE & BRO.

Manufacturers of

FIRE BRICK And Furnace Blocks, DRAIN PIPE AND LAND TILE,

Woodbridge. - - N. J. BORGNER & O'BRIEN.

BRICK

Edge Pressed Furnace Blocks, CLAY RETORTS, TILES, &c., Twenty-third Street,
PHILADELPHIA Twenty years' practical Experience.

WATSON FIRE BRICK CO., ESTABLISHED 1836.

OHN R. WATSON, Porth Amboy, New Jersey Manufacturers of

FIRE BRICK,
FOR ROLLING MILL, BLAST FURNACES, FOUN
DRIES GAS WORKS, LIME KILNS, TANNERIES,
BOILER and GRATE SETTING, GLASS WORKS, &c.
Fire Clays, Fire Sand, and Kaelin for Sale. HENRY MAURER,

Excelsior Fire Brick & Clay

Retort Works,
utacturer of FIRE BRICK, HOLLOW
BRICK AND CLAY RETORTS.

WORKS: PERTH AMBOY, NEW JERSEY Office & Depot 418 to 422 East 23d St., N. Y. TROY FIRE BRICK WORKS, Troy, N. Y ..

JAMES OSTRANDER & SON.

Established 1848. Manufacturers of

FIRE BRICK, Tuyeros, Tiles, Blast Furnace Blocks, &c. Miners and Dealers in Woodbridge Fire Clay and Sund, and Staten Island Kaelin.

Established 1864. GARDNER BROTHERS

STANDARD SAVAGE FIRE BRICK, TILE & FURNACE BLOCKS,

dlay Gns Retorts and Retort Settings, and Miners and Shippers of Fire Clay.

Fries: 116 Smithfield St., Pittsburgh, Pa.

WORES: Mt. Savage Junction, Md., and Leckborf Pa.

HALL & SONS,

FIRE BRICK,

Buffalo, N. Y. CHAS. D. COLSON,

DINAS, SCOTCH, SAVAGE, JERSEY, and other FIRE BRICKS.

The Largest and Best Assorted Stock of Tiles and Bricks, Fire Clay, Foundry Supplies, &c., in the United States.

CHICAGO ILL. UNION MINING COMPANY.

Mount Savage Fire Brick. EDWARD J. ETTING Agent, 999 South Third St., Philadelphia, Pa.

A. HALL TERRA COTTA CO., Manufacturers of

FIRE BRICK, FURNACE BLOCKS, &C. ARCHITECTURAL TERRA COTTA.

Moulded, Buff, and Colored Building Brick. Perth Amboy, N. J.

PERTH AMBOY TERRA COTTA CO., MANUFACTURERS OF

FIRE BRICK. For Blast Furnaces and Rolling Milla.

Offices, 80 & 81 Astor House, New York WILLIAMS, WHITE & CO. MOLINE, ILLINOIS.

DROPHAMMERS, HORIZONTAL PRESSES FOR BENDING IRON, GANG BORING MACHINES, TOOLS FOR PLOW MAKERS THE JUSTICE HAMMER.

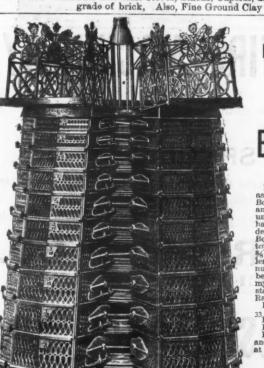
SEND FOR CENCULARS

WOODLAND FIRE BRICK CO., LIMITED,

Woodland, Clearfield Co., Pa.,

"WOODLAND" BRAND FOR STEEL FURNACES OF ALL KINDS, BLAST FURNACES AND MALLEABLE IRON WORKS.

"BRADFORD" Brand for Rolling Mills, Glass Houses, &c. W F. B." Brand for Hot Blast Stoves, Stacks, Cupolas, and all work requiring a cheap grade of brick, Also, Fine Ground Clay to lay brick.



WESTPHAL'S PATENT

Independent Revolving Shelves

AND SELF-LOCKING

BOLT CASE.

For all goods of heavy weight, such as Carriage, Tire, Stove and Machine Bolts and Screws, Taps, Set-Screws and Wasters, this structure stands unequaled. The case, as presented, has 38 compartments, each one, as designed—full large—to hold so or 100 Bolts, as they come in papers. The top ornament forms a rack for ½ and % Bolts, from 8½ to 16 incher in length. Tan papers, 50 each, any numbers or letters, to suit goods to be placed in Case, can be ordered at my expense, and I will have them stamped from Sheet Brass to fit Card Rack of Case.

Height (exclusive of top ornament), 31 inches.
Diameter (at top), 21 inches.
Every Case is shipped at my risk, and if not all I claim, can be returned at my expense, and I will thank you.

We also Manufacture Screw and Shot Cases,

FOR SALE BY

HIBBARD, SPENCER, BARTLETT & CO.

H. WESTPHAL, 86 Market St., Room 28, Chicago, III. KEYSTONE SOCKET RAKE.



THE F. F. ADAMS COMPANY, Erie, Pa.

ASBESTOS PACKING



MINERS AND MANUFACTURERS OF ASBESTOS.

Office, 169 Congress St., BOSTON.

Steam Packings, Wick, Fiber, Mill Board,

Cement Feiting,
Pipe and Boiler Coverings,
Cloth, Yarns, &c. BOLLING & LOWE, 2 LAWRENCE POUNTNEY HILL, LONDON, E. C.



BLAIR'S PAT. HOG and PIG RINGERS. E. BLAIR, Manufacturer, BUCYRUS, OHIO. Beware of Infringers who are offering imita-tions and will come to grief.

CONNELLSVILLE M. SCHOONMAKER.

MANUFACTURER AND SHIPPER OF CONNELLSVILLE

Capacity of Mines, 2500 Tons Daily. Siding connections with all lines of Railroads.

Office, 128 Water Street, PITTSBURGH, PA. A PERFECT RAKE FOR CLEANING LAWNS.



The teeth of this Rake are so formed that it is impossible to tear the grass or injure the lawn in any manner. As a stable and general purpose Rake it is unequaled. No implement made so completely fills the immense demand for a lawn cleaner. For sale by Jobbing, Hardware, Implement and beed Houses throughout the United States, England and Germany.

W. A. HALTEMAN & CO., Mfrs., Dayton, Ohio, U.S. A.

Bra. Tieb McF. Reev Rey Bridg Mosel Bron: Am. Builde Clark Whip

Car A: Carring
Towns
Carring
Towns
Ligget
Smith
The E.
Carris—Payson
Payson
Custers
Payson
Custers
Payson
Haight
Hamme
Haven
Keenlee

Acplication of the control of the co

Moseley Iro

The Iron Age Directory

and Index to Advertisements.	Cupotas. Smith & Sayre Mig. Co., 245 Broadway, N. Y45 Cutlery. Importers of.	Hoisting Machines. Box Alfred & Co 12 Green, Phila
and the state of t	Cutlery, Importers of. Boker Hermann & Co., for Duane, N. Y	Box Alfred & Co., 42 Green, Phills
Agricultural Implements. Grant Fan Mil and Cradle Co. Melrose, N. V	Cutlery, Hanufucturers of. Bannister A. F. & Co., Newark, N. J	Hose Reels.
Air Compressors. Clayton Steam Pump Works. Brooklyn, N. Y46 The Norwalk Iron Works Co., S. Norwalk Conn 44	Dog Collars. Medford Fancy Goods Co., of Duane, N. Y	Whelpley R. H., Chicago, Ill
Alarm Money Drawers. Oneida Alarm Till Co., East Syracuse, N. Y10 Tucker Alarm Till Co	Dinner Pail and Lantern. Haight Joseph, Port Chester, N. Y	Hooks. Cent and Hat. Van Wa~oner & Williams, 82 Beekman, N. Y
Auti-Friction Metals. Reeves Paul S. Philadelphia	Door Hangers, House and Barn. Moore S. H. & E. Y. Chicago, Ill	Hooks (Cotton & Bairs) New York Handle & Mailet Works, 4-6 E. Houston.
Anti-Shaft Rattler. Cleveland Flue Cleaner Mfg. Co., Cleveland, O12 Anvils. Manufacturers of.		Horse Hay Forks. Waldrop & Sprout, Muncy, Pa
Boker Hermann & Co., 101 and 103 Duane, N. Y36 Fisher & Norris, Trenton, N. J	Drilling Machines, Makers of, Clark, Sints & Co., Springfield, O	
Arms and Ammunition. Field Alfred & Co., 93 Chambers, N. Y	Peerless Punch & Shear Co. 115 Liberty N.Y45 Wiley & Russell Mfg. Co., Greenfield, Mass40	Essex Horse Nail Co. Troy, N. Y
Smith, Otis A., Rockfall, Conn	Brown R. H. & Co., Westville, Conn. .44 Chicago Forging Co., Chicago, Ill. .32 Merrill Bros., 26 First St., Brooklyn, E. D. .27	Horse Rasps and Files. Heller & Bro., Newark, N. J.
The Asbestos Packing Co., Boston, Mass30 Atomizers. Rowland, Thos. F., Brooklyn, N. Y	Merrill Bros., 26 First st., Brooklyn, E D	Phode Island Home Shee Co. P.
Atterney at Law.	Enves Trough Hanger. Heartley Geo. W., Toledo, O36	The Burden Iron Co., Troy, N. Y.
Axies. Springs. &c Manufacturers of. Concord Axie Co., Fisherville (Concord). N. H28 Cook R. & Sons, Winsted. Conn	Edge Tools, Vakers of. Doscher M., & Chambers, N. Y	Witherow & Gordon, Pittsburgh Pa
Gautier Steel Dpt. of Cambria Iron Co , Johnstown, Pa	Blevators. Makers of. Clem & Morse, Philadelphia Pa	Hydrauts, &c. 37 McLean John, 300 Monroe, N. Y. 10 Eddy Valve Co., Waterford, N. Y. 43 Hydraulic Jacks. 43
Bankers.	Vitrided Wheel Co., Westfield, Mass	Hydraulic Jacks. Oudgeon Richard, 24 Columbia, N. Y. Watson & Stillman, 470B Grand, N. Y. Ice Cream Freezers.
P. W. Galiaudet & Co., 2 Wall, N. Y	Emery and Emery Wheels. Union Stone Co. Boston, Mass	Roebuck S. & Co., 164 Fulton, N. Y. White Mountain Freezer Co., Nashua, N. H
Haish J. & Co., DeKaib, III. 29 Hawk Eye Steel Barb Fonce Co., Burlington, Iowa.41 Jowa Barb Wire Co., co John, N. Y. 29 Washburn & Moen Mig. Co., Worcester, Mass. 2	Colts Pat. Fire Arms Co., Hartford, Conn	Heartley Geo. W., Toledo, O
Washburn & Moeu Mig. Co., Worcester, Mass 2 Barb Wire Machinery. Stover Mig. Co., Freeport, Ill	Engines, Gas. Schleicher, Schumm & Co., Philadelphia45	Fairbanks & Co., 311 Broadway, New York
Bellews, Manufacturers of. Flaccus Wm. & Son, Pittsburgh, Pa. 9 Scott Geo. M. Chicago, Ill. 37	Engines, Locometive,	Insurance, Boiler. Hartford Steam Boiler Insuection & Insurance Co., 30 Iron. (Manufacturers' Agents.)
Belia (Sleigh.) Bevin Bros. Mfg. Co., Easthampton, Conn	Bagines. Steams Makers of. Cooke & Co., 12 Cortlandt, N. Y. Cooke & Co., 12 Cortlandt, N. Y. Cox & Sons, Philadelpia, Pa. Dunbar, R. & Son, Buffair, N. Y. Ervien Chas, W. & Co., Philadelphia, Pa. Noteman Rotary Engine & Pump Co., Toledo, O., 45 Noteman Rotary Engine & Pump Co., 45 Noteman R	From. (Manufacturers' Agents.) Cox. Jr., Justice & Co., 11 Wainut, Phila. Froment Frank L. 112 John st., N. Y. Hoffman J. W. & Co., 268 S., 4th, Phila. Levis Henry & Co., Philadelphia, Pa. Lundell Chas. G. (Swedlab), Boston, Mass.
Belt Hooks, Browning, Sisum & Co., 85 Chambers, N. Y	Ervien Chas. W. & Co., Philadelphia, Pa	Lundell Chas. G. (Swedish), Boston, Mass
Beiting, Mukers of. Alexander Bros., 412 N. 3d, Philadelphia	Southwark Foundry & Machine Co. Philadelphia	Atbany & Rensselaer Iron & Steel Co., Troy, N. Y. 38 Birmingham Rolling Mill Co., Louisville, Ky 6 Britton Iron and Steel Co., Cleveland, O.
Belt OilPost E. L. & Co., 10 Peck Slip, N. Y17	The Cummer Engine Co., Cleveland, O	Burden Iron Company, Trov. N. Y. Calumet Iron & Steel Co., Chicago., III. Carnegte Brov. & Co., Limited, Pittsburgh, Pa
Beit Protectors. Lewis Edward S., Albany, N. Y	Engravers, Wood, Cros-cup & West. Philadelphia, Pa36 Stillman & Co., Cincinnati, O32	nevations zoiting Mill, Limited, Pittaburgh, Pa. 39 Kirsnatrick & Co., Pittaburgh Pa. 4 Leavitt, C. W., 161 Broadway, N. Y.
	Facings, Foundry, Am Facing Co., 217 W. 18th. N Y	Montour Iron & Sies: (o., Danville, Pa. 4 Pheenix iron Co., 410 Walnut, Philadelphia
Bird Cages. Makers of. Gunther G., 46 Park Piace, N. Y. Jewett John C. & Sons, Buffalo, N. Y. 55 Pierce Geo, N. & Co, Buffalo, N. Y. 32 Lindeman O. & Co., st, Fearl, N. Y. 48 Xwell John, a 7 and 24 Pearl, N. Y. 7	Faucets, Makers of.	Rome Merchant Iron Mills, Rome, N. Y. 6 Rowland James & Co., cap N. Delaware ave., Phile
Blacksmith's Drills. Illinois Iron and Bolt Co., Carpentersville, Ill27	North Brothers, Ph'ladeiphia, Pa	Bruin. Massifacturers of. Albany & Rensselaer Iron & Steel Co., Troy, N. Y., 38 Birmingham Rolling Mill Co., Louisville, Ky. Britton Iron and Steel Co., Cleveland. O Burden Iron Company, Troy, N. Y. Calumet Iron & Steel Co., Chicago., III. Carnegte Bros. & Co., Limited, Pittsburgh, Pa., 30 Revstone Rolling Mill, Limited, Pittsburgh, Pa., 48 Kirstnatrick & Co., Pittsburgh Pa., 48 Leavitt, C. W., 161 Hroadway, N. Y. Leonard Jonn & Steel Co., Danville, Pa., 50 Roman Iron Co., Chicago., Danville, Pa., 50 Roman Iron Co., Change, Tenn. Y. Roman Iron Co., Change, Tenn. Y. Rowland James & Co., 20 N. Danville, Pa., 50 Rowland James & Co., 20 N. Danville, Ph., 50 Rowland James & Co., 20 N. Danville, Ph., 70 Rowland James & Co., 20 N. Danville, Ph., 50 Rowland Wm. & Harvey, Philadelphia. 46 Bhoenberser & Co., Pittsburgh Philadelphia. 46 Bhoenberser & Co., Pittsburgh Philadelphia. 47 The Passate Rolling Mill Co., Paterson, N. J. Violater Iron Works, O. Broadway, N. Y. Wood Alan & Co., Arch, Philadelphia. 51 Rek yz & Walbaum, Philadelphia. 51 Rek yz & Walbaum, Philadelphia. 51 Rek yz & Walbaum, Philadelphia. 52 Renk yz & Walbaum, Philadelphia. 5
Blind Awning Fixtures. North F. W. & Co., Boston, Mass32	Food Cuttors.	Ulater Iron Works, to Broadway, N. T. Wood Alan & Co., Arch. Philadelphia.
Blasting Materials. Hercules Powder Co., Cincinnati O	Ross E. W. & Co., Fulton, N. Y	Iron Brokers. Blak y & Walbaum, Philadelphia, Pa. Boynton Geo. A., 70 Wall, N. Y. Etting Edward J., Philadelphia, Pa. Fox & Drummond, 68 Wall, N. Y. Reed Joseph P. & Co., Philadelphia, Pa. Watts Ethelbert, Philadelphia, Pa. 5 Tran. Charcosal, Warm or Cold Blass. 5 Tran. Charcosal, Warm or Cold Blass.
Blocks, Tackie, Makers of. Bagnall & Loud, Boston, Mass. McCov & Sanders, 26 Warren, N. Y. McMillan Wm. H. & Bro., 11 South, N	National Wire and Iron Co., Detroit, Mich35 Van Dorn Iron Works, Cleveland, O	Fox & Drummond, 68 Wall, N. Y. Reed Joseph P. & Co., Philadelphia, Pa.
Penneld Block Co., Lockport, N. Y 16	Field Aifred & Co. 93 Chambers, N. Y	Hensheim L. (Austriau), 20 Nassau, N. Y.
The Miller Co., Canton, C		Hernsheim L. (Austrian), 20 Assau, N. Y. 6 Lundell Chas. G. (Swedish). Roston, Mass. 6 Quincy Joha W. & Co., 28 William, N. Y. 4 Iron Commission Merchant.
m - Alice - Manager	Files, Manufacturors of. Auburn File Works, & Chambers, N. Y. ABarnett G. & H. 41 and 42 Richmond, Phila. 8 Detroit File Works, Detroit, Mich. 8 Everhart James M. Scranton. 22	Iron Commission Merchants. Groome. Roberts & Co., Philadelphia, Pa. Heberton & Co., Philadelphia. Hernshelm L., 20 Nassau, N. Y.
Batters, Steam. Edge Moor Fron Company, 70 Liberty, N. Y	Detroit File Works, Detroit, Mich. 5 Everhard James M. Seranton, Fa. 46 Henseler Christian, Philadelphia, Pa. 46 Hiscox File Mig. Co., West Cheimsford, Mass. 8 Johnson & Bro., 1 Commercial, Newark, N. J. 8 McCaffrey & Bro., 1970 and 1734 N. 4th. Phila. 8 Nicholson File Co., 17 Covidence, R. 4. 8 Spencer, Mathias & Sons, Shemield, England. 16 Union File Works, Baitimore, Md. 5 Fire Strick, Material. 5	Groome. Roberts & Co., Philadelphia, Pa. 5 Heberton & Co., Philadelphia. 5 Hernshelm L., 20 Nassau, N. Y. 6 Lea J. Tatnall & Co., Philadelphia. 5 Lundberg Gustaf, Boston, Mass. 5 Lundell Chas. G., Boston Mass. 5 Mohr J. J., 20 Walnut. Philadelphia. 6 Wister L. & R. & Co., Philadelphia, Pa. 5
Beit and Hivet Clippers. Chambers, Brother & Co., Philadelphia, Pa38 Beit Cases.—Westphal Henry, Chicago, Ill30	McCaffrey & Bro., 172 and 1734 N. 4th, Phila	Mohr J. J., 430 Walaut. Philadelphia Wister L. & R. & Co., Philadelphia, Pa
Bolt Cutters. Howard Iron Works, Buffalo, N. V.	Spencer, Mathias & Sons, Sheffield, England	Aboel Brothers, 198 South, N. Y
Bolt Cutters, Morks, Buffalo, N. Y	Borgner & O'Brien, Philadelphia, Pa	Borden & Lovell, 70 and 71 West, N. Y. Carmichael & Emmens, reand 112 Cedar, N. Y 4 Cooney thaniel F., 88 Washington, N. Y
Balta American Bolt Co. Lowell. Mass.	Gardner Scothers, Pittaburgh, Pa	Exleston Bros & Co., Philadelphia, Pa. Exleston Bros & Co., to South, N. Y Harrison & Gilloon, 48 to 55; Water, N. Y
J. D. Steele & Sons Mfg. Co., Pottetown, Pa	Maurer Henry, 416 East 23d, N. Y	Hoffman J. W. & Co., 26 S. Fourth, Philadelphia. 5 Hubbard Chas., 46 Cliff, N. Y.
Boxes for Hardware. Green S. H., 12 Murray, N. Y	Union File Works. Baitimore. Md. 8 Fire Brick. Makers or. Borgner & O'Brion, Philadelphia, Pa. 90 Cotson Chas D. Chicego. III. 10 90 Evens & H. D. Chicego. III. 10 90 Evens & H. Chicago.	Borden & Lovell, 70 and 71 West, N. Y. Carmiohael & Emmens, re and rus Cedar. B. Y. Coonev thaniel F. 88 Washington, N. Y. Coonev thaniel F. 88 Washington, N. Y. Cox Justice, Jr. & Co., Philadelphia, Pa. Egleston Bros & Co., 160 South, N. Y. Harrison & Gillion, ut to (50 Water, N. Y. Harrison & Gillion, ut to (50 Water, N. Y. Hashfield, Eyre & Co., London, England. Hubbard has., & Circ S. Yourth, Philadelphia, 17 Hubbard has., & Circ S. Yourth, Philadelphia, 19 Judson B. F., 4:Yand 46 Water, N. Y. Keeley Jerome & Co., Philadelphia, Pa. Lloyd & Lindsay, Philadelphia, Pa. Lundberg Gustaf, & Bilby, Boston, Mass. Ondell Chas. G. (Swedish), Boston, Mass. Middleton W. S., (2) John, N. Y. Naylor & Co., 93 John, N. Y. Naylor & Co., 29 John, N. Y. Pullman, J. Wesley, Philadelphia, Pa. Guincy John W. & Co., 48 William, N. Y. Waliace & Wm. H. & Co., Philadelphia, Pa. Waliace & Wm. H. & Co., Philadelphia, Pa. Waliace & Wm. H. & Co., Philadelphia, Pa. Whine E. H. & Co., Philadelphia, Pa. Vene Founders.
Brass, Manufacturers of. Ansonia Brass and Copper Co., 19 Cliff, N. Y 2&9 Bridgeport Brass Co., Bridgeport Conn	Un'on Mining Co., Philadelphia, Pa	Lundell Chas. G. (Swedish), Boston, Mass
Brass, Managacturers of. Ansonia Brass and Copper Co., 19 Cliff, N. Y 2&9 Bridgeport Brass Co., Bridgeport Conn. 2 Brown & Bross, St Chambers, N. Y 2 Cook & Wilson, Newark, N. J 5 Davol John & Bons, 100 John, N. Y 2 Detroit Copper and Brass Roiling Mills, Detroit.	Woodland Fire Brick Co., Woodland, Pa	Ogden & Wallace, 5s, 5r, 5e and 91 Elm, N. Y
Detroit Copper and Brass Rolling Mills, Detroit. Mich	Fittimes. Maileable and Gray Iron. Star Machine Works, Cleveland, O	Wallace Wm. H. & Co., A'bany and Washington streets, N. Y.
Bitch Copper State Control of the Co	Fluor Spar. Burbank B. & Co., Evansville, Ind	Whitney A. R. & Co., & Hudson N. Y
Bross Mutt Hinges.	Forges. Portable, &c. Buffalo Forge Co., Buffalo, N. Y. Holt Mfg. Co., Cleveland, O. Keystone Portable Forge Co., 218 Carter, Phila	Bannan Fras. R., Pottaville, Pa
Tiobout W. & J. 16 and 18 Chambers, N. Y	Keystone Portable Forge Co., 218 Carter, Phila16 Forgings, Iron and Steel.	Iron. Pig. Importers of. Abbott Jere & Co. (Swedish), New York & Boston39 Rubbar!, Chas. 46 Ciff. N. V.
Brass founders McFarland Wm., Trenton, N. J	Forgings, Iron and Steel. Alker & Cromlish, Allegheny, Pa	Lee James & Co., 72 Pine, N. Y
Bridge Builders. Moseley Iron Bridge and Roof Co 5 Dey, N. Y 4 Bronze Bearings. Am. Bronze Works, Cleveland, O	Foundry Supplies. Am. Facing Co., 17 W, 15th, N. Y 20 Smerick J. A. & Co., Philadelphia, Pa. 3 Obermayer, S. & Co. Cincinnati, O. 12	Iron. Pis. Importers of. Abbott Jere & Co. (Swedish). New York & Boston99 Hubbar', Chas., 46 Cliff. N. Y. Lee James & Co 72 Pine. N. Y. 4 Lundberg Justaf. Boston. M'ss. Lundeli, Chas. G. (Swedish). Boston, Mass. 6 Richardson, L. Lundeli, Boston, Mass. 6 Richardson, L. Lundeli, Boston, Mass. 7 Richardson, L. Lundeli, L. Lundeli, L. Lundeli, C. Lundeli, C. Lundeli, C. Lundeli, C. Lundeli, L. Lun
Buckets, Pump and Elevator. Rowland T. F., Brooklyn, N. V	Stokes & Parrish, Phila., Pa	Williamson James & Co., 69 Wall N. Y
Builders' Hardware, Clark Mig. Co., Buffalo, N. Y	Furnaces, Makers of. Richmond & Potts, 119 8, 4th. Phila., Pa	Jersey City Galvanising Co. Jersey City, N. J. 4 Lefterts, Marshall & Co., oo Beekman, N. Y. 4 Wood W. D. & Co. Pittsburgh, Fa. 4 Iran, Steel and Nails.
	Jos. Dixon Crucible Co., Jersey City, N. J20	Iron, Ateel and Nails. Morris, Wheeler & Co., 14 Cliff, N. Y
Surra and Hinges. Stanley Works, Now Britain, Conn	Grate Bars. Ætna Grate Bar Co., 110 Liberty, N. Y	Millers Falls Co., 74 Chambers, N. Y
Carriage Bolts. Makers oy. Townsend. Wilson & Hubbard, Philadelphia	Grindstones.	Lauterns, Manufacturers of, Dietz R. E., 54 and 56 Fulton, N. Y
Carriage Hardware. Nakers or. Liggett Spring and Axie Co. Pittsburgh, Pa	Wood Waiter R., 283 and 285 Front N. Y	Lathes, Pulley Blocks. Drills, Harrington E. & Son, Philadelphia, Pa
	Lafilp & Rand Powder Co. 29 Murray, N. Y	Lawn Mowers. Carr & Hobson, 47 Cliff, N. Y
Cantings, Bruss and Live.	Hammers, Steam. Bradley & Co., Syracuse, N. Y	
Bowler & Co., Cleveland, Ohio	Hand Force Pumps. Union Mig. Co., 95 Chambers, N. Y	Lemon Squeezers. Dean Wm B., 48 Murray, N. Y. Jennings C. E. & Co., 96 Chambers, N. Y. Skyser & Rex, Frankfort, Philadelphia. 25 Lloyd, Supplee & Walton, 62 Market, Phila 25 Onderdonk R., 405 Grand, N. Y. 40 Ripley Mfg. Co., Unionville, Cons. 27
Devlin Thos. & Co., Philadeiphis, Pa. 7 Haight & Clark, Albany N. Y. 9 Haumer & Co., Branford, Conn. 10	Musselman & Son. Quakertown, Pa	Ripley Mfg. Co., Unionville, Conn
Reppleman John. Reading, Pa. Liverside Foundry Works. Cleveland, Ohio	Handles and Spokes. Hundley V. G., 79 Reade, N. Y	
Charter Steat Castings Co. 404 Library Phile Pa 46	Hardware Commission Merchants. Field Affred & Co., of Chambers, N. Y	Durrie & McCarty, of Chambers, N. Y. 25 Hillebrand & Wolf. 110 S. Stn. Philadelphia. 42 Quackenbush J. E. & Son. 33 Sth. av., N. Y. 39 Romer & Co., Newsyk, N. J. 31 Smith & Eage Mgs. Co., Bridgepore, Conn. 32
Flagg Stanley G. & Co., Philadelphia	Lovejoy & Drake, 101 Chambers, N. Y32 Hardware Dealers. Llovd, Supplies & Walton, 625 Market, Phila	The Charles Parker Co., Meriden, Conn
Bradlee & Co., 816 Richmond St., Phila., Pa 5 Chemicaia	Hardware Importers.	Lubricator Cups.
Chiseis, Manufacturers of. Buck Bros., Milibury Mass	Field Alfred & Co., 69 Chambers, N. Y	Machinery, Adt John, New Haven. Conn. Adt John, New Haven. Conn. Barnes W. F. & John, Rockford, Ill. Bliss, E. W., 167 Plymouth, Brocklyn Jodge, Heler & Lyons, Newark, N. J. Forsath S. C. & Co., Manchester, N. H. Garvin E. F. & Uo., 190 Centre, N. Y. Peerless Punch and Shear Co., 28 W. Dey, N. Y. Fittsburgh Mrg. Oo., Fittsburgh
Jackson A P & Son Milliont W V	Hardware Manufacturers. Enterprise Mfg. Co., Phila	Dodge, Heller & Lyons, Newark, N. J. 8 Forsaith S. C. & Co., Manchester, N. H. 44 Garvin E. E. & Co. 130 Centre, N. Y. 44
Randolph B. S., Martinsburgh, W. Va	Miller's Falls Co., 74 Chambers, N. Y. 25 Stanley Works, New Britain, Conn. 13 Trenton Lock & Hasdware Co., Trenton, N. J. 16 Union Mrg. Co., 99 Champers, N. Y. 7 Whipple Mrg. Co., Cleveland, O. 13	Peerless Punch and Shear Co., 28 W. Dey, N. Y
Ulock Springs, &c.	Whippie Mfg. Co., Cleveland, O	Peerless Punch and Shear Co., 38 W. Dey, N. Y. 45 F Pittaburgh Mg. Co., Pittaburgh Ps. 43 Purdy Bachine Co., Cleveiand, O. 44 Sellers Wm. & Co., Phila. and 70 Liberty, N. Y. 45 Smith H. B. Mach. Co., Philadelphia, Pa. 9 Stokes & Parrish Phila., Ps. 44 Stow Flexible Shaft Co., Limited, Philadelphia. 45 The Stiles & Parsker Press Co., Middletown, Conn. 40 Wetherili Robert & Co., Chester, Ps. 45
Coni. Miners of. Pardee A. & Co., 111 Broadway, N. Y	Hardware Specialties. American Machine Co., 128 Chambers, N. Y. 42 Kyser & Rex, Philadelphia, Pa. 25 Moore S. H. & E. Y., Chicago. 35 Rhode Island Tool Co., Providence, B. I. 37 Stencer & Underhill, 94 Chambers, N. Y. 30 Wollenank J. F. Chicago. III 30	The Stiles & Parser Press Co. Middletown, Conn. 46 Wetherili Robert & Co. Chester, Pa
	Rhode Island Tool Co. Providence, R. 1	macainery Maring Mill.
Compasses and Caripers, Manufacturers of	Harness Sunps. Covert Mfg. Co., West Troy, N. Y42 Hay Knives.	Biaisdell P. & Co., Worcester, Mass
Copper.—Brown & Broo., St Chambers, N. Y 2 New Haven Copper Co., 250 Pearl, N. Y 2 Pobe, Cole & Co., Haltimore, Md.	Hay Knives. Hiram Holt & Co., East Wilton, Me	Birmingaam from Foundry, Sirmingaam, Conn. 12 Hac-hinste? Tools and Sapplics. Blaisdell F. & Co., Worcester, Hass. 43 Eynon W. R. & Sons, Cleveland, O. 10 Bi-tcher Wm. H
Pope Thos. J & Bro., 202 Pearl, N. Y	Hinges. Works, New Britain, Conn	Sellers Wm. & Co Phila., and 70 Liberty, N. Y45 Wickersham & Co Philadelphia, Pn
Corn. Bean, and Beet a lanter. Gordon S., Chery, N. Y	Hoes.—Bruce George W., 1 Platt, W Y	N. Y. Handle and Mallet Works, 456 E. Houston
Corrugated Fron. Moseley Iron Bridge and Boof Co., 5 Dey. N. Y 4	H. W. tili & Co., Decatur, Di	muly Goo, at a Co., 353 Classon Ave., Brooklyn, N.Y. 10

	ľ
Coverings Bellevand Was	T
Coverings, Boiler and Pipe. Chalmers Spence Co., 23 John St., N. Y	1
Orncibles, Soidel R. B., Philadelphia, Pa	
Cuttery. Importers of. Boker Hermann & Co., for Duane, N. Y	
John Russell Cutlery Co., Turners Falls, Mass46	
Dog Collars. Medford Fancy Goods Co., of Duane, N. Y	
Diuner Pail and Lantern. Haight Joseph, Port Chester. N. Y	
Door Hungers, House and Barn. 35 Moore S. H. & E. Y., Chicago, Ill. 35 Stearns E. C. & Co., Syracuse, N. Y. 40 Ferry Mr. Co., Dundee, N. Y. 29 Wilcox Mrg. Co., Aurora, Ill. 39	
Terry Mrs. Co., Dundee, N. Y	
Drilling Machines, Makers of. Clark, Sintz & Co., Springfield, O	1
E. L. Harrington, Philadelphia, Pa	
Drop Forgings. Brown R. H. & Co., Westville, Conn	1
Merrill Bros., 26 First st., Brooklyn, E D	1
Williams, White & Co., Moline, Ill	1
Doscher M., & Chambers. N. Y	
Stokes & Parrish, Philadelphia	1
Emery and Emery Wheels. Union Stone Co. Boston, Mass	1
Engines Disk. Colts Pat. Fire Arms Co., Hartford, Conn20	1
Engines, Fire. La France Fire Engine Co., Elmira, N. Y43 Engines, Gus.	1
Schleicher, Schuffnm & Co., Philadelphia	1
Baldwin Locomotive Works, Philadelphia, Pa 6 Engines, Steam. Makers of.	1
Engines, Steam, Makers of. Cooks & Co. 12 Cortlandt, N. Y. 9 Cox & Sens, Philadelpia, Pa. 45 Dunbar, R. & Son, Buffain, N. Y. 44 Ervien Chas, W. & Co., Philadelphia, Pa. 45	
Noteman Retary Engine & Pump Co., Toledo, O., 43 Bumsey L. Mfg. Co., St. Louis, Mo	1
Noteman Royary Engine & Pump CO., Toledo, O., 48 Rumsey L. Mig. Co., St. Louis, Mo. Southwark Foundry & Machine Co., Philadelphia, 42 Southwark Foundry & Machine Co., Philadelphia, 47 The Cummer Engine Co., Cleveland, O., Norwalk, Cons., 41 The Pure also Work Work Mining too, Bol., 44 Wetherlii Robt. & Co., Chester, Pa., 44	-
Wetherili Robt. & Co., Chester, Pa.,	
Engravers, Wood. Crosscup & West. Philadelphia, Ps	1
Facings, Foundry. Am Freing Co., 17 W. 14th N Y	1
Faucets, Makers of. McNan & Harlin Mfr. Co., 30 Gold, N. Y.,	
North Brothers, Ph'ladeiphia, Pa	
Lane Bros. Poughkeepsie, N. Y	
Feed Cutters. Ross E. W. & Co., Fulton, N. Y	1
Fences. Wrought Iron. E.T. Bacaum Wirs and Iron Works, Detroit, Mich 33 National Wire and Iron Co., Detroit, Mich. 36 Van Dorn Iron Works, Cleveland, O. 12	
Files, Importers of, Field Aifred & Co. 93 Chambers, N. Y	
Montgomery & Co., 104 Pulton, N. Y	
Auburn File Works, & Chambers, N. Y	
Everhart James M. Scranton, ra. 46 Henseler Christian, Philadelphia, Pa. 8	
Johnson & Bro., I Commercial, Newark, N. J 8 McCaffrey & Bro., 1721 and 1734 N. 4th, Phila	
Moss F. W. so John. N. Y	1
Union File Works. Baitmore. Md. Fe Brick. Makers. Borgner & O.B. D. Civicego. III. Evens & H. W. Holeson. II. Evens & H. W. Holeson. II.	
Colson Chas. D., Chicsgo, Ili	
A. Hall Terra Cotta Co., Perth Amboy, N. J. 30 Hall & Sons, Buffalo, N. Y. 39 Evalence R. & Sons, foot of E. Houston, N. 30	9
Maurer Henry, 415 East 23d, N. Y. 30 Newton & Co., Albany, N. Y. 30 Octrander Lames & Son, Troy N. Y. 30	
Perth Amboy Terra Cotta Co., So and Si Astor House, New York.	
Un'on Mining Co., Philiadelphia, Pa	-
Woodland Fire Brick Co., Woodland, Pa	
Ittings, Malleable and Gray Iron.	
Star Machine Works, Cleveland, O	
	I
Forges. Portable, &c. 16 Buffalo Forge Co., Buffalo, N. Y. 16 Holt Mg. Co., Cleveland, O. 43 Keystone Portable Forge Co., 218 Carter, Phila. 16	E
forgings, iron and Steel. Alker & Cromlish, Allegheny, Pa	
Rose Wm. z Bros. West Pattadelphia, Pa	
Coundry Supplies. Am. Facing Co., 17 W., 15th, N. Y	
Stokes & Parrish, Phila., Pa	I
Richmond & Potts, 110 S. 415. Phila., Ph	I
Jos. Dixon Crucible Co., Jersey City, N. J.	J
rate Bars. Ætna Grate Bar Co., 110 Liberty, N. Y	1.
McDermott & Beres Stone Co. Cleveland O	L
Wood Walter R. 283 and 26 Front N. Y. 33 Worthington & Sons, Cleveland, O. 32	I.
Lafilp & Rand Powder Co. 29 Murray, N. Y	L
inns, Pistols, &cc. Kittredge B. & Co., Cincinnati, O	L
Inmmers, Steam. Bradley & Co., Syracuse, N. Y	
Musselman & Son. Quakertown, Pa	
Inndles (Hickory). McCullough, Woodbury & Co., Knoxville, Tenn35	L
Indies and Spokes. Hundley V. G., 79 Reads, N. Y	
lardware Commission Merchants. Field Afred & Co., or Chambers, N. Y. 10 Graham & Haines, 113 Chambers, N. Y. 8 Lovejoy & Drake, 101 Chambers, N. Y. 32	1
Lioyd, Supplee & Waiton. 625 Market, Phila25	
Boker Hermann & Co., 101 Duane, N. Y	M
mrdware Job Lovs. Wheeler, A. W., Chicago, Ill	
heid Afred & Co., of Chambers, N. Y. 10 Inrdware fob Love. Wheeler, A. W., Chicago, Ill. Inrdware Manufacturers. Enterprise Mfz. Co., Phila. Lloyd, Supplee & Waiton, tos Market, Phila. Pa. 25 Lloyd, Supplee & Waiton, tos Market, Phila. Pa. 25 Miller's rails Co., 7a Chambers, N. Y. 25 Stanley Works, New Britain, Conn. 33 Trenton Lock & Hardware Co., Trenton, N. J. 10 Union Mfg. Co., of Chambers, N. T. 7 Whipple Mfg. Co., Cleveland, O. 13 Ardware Nancel Miles.	-
Miller's ralls Co., 74 Chambers, N. Y	1
Union Mfg. Co., 99 Champers, N. Y	1
American Machine Co., 128 Chambers, N. Y	1
ardware Special Ilies. American Machine Co., 138 Chambers, N. Y. 42 Kyer & Kex, Philadelphia, Fa. 55 Kyer & Kex, Philadelphia, Fa. 55 Kyer & Kex, Philadelphia, Fa. 55 Kyer & London Co., Providence, R. 55 Bhode Island Tool Co., Providence, R. 50 Wollensak J. F. Chicago, Ill. 42	M
Covert Mfg. Co., West Troy, N. Y	39
Hiram Holt & Co. East Wilton Me.	1
eater and Purifier. Feed Water. The National Pipe Bending Co., New Haven, Conn. 41 Inges. Stanies Works, New Britain, Conn. 33 Union Mfg. Co., 66 Caambers, N. Y	A 10 W
Union Mig. Co., 96 Chambers, N. Y	M

	THE IRON AG	
35	Hoisting Engines, Makers of.	
41	Crane Bros., Mfg. Co., Chicago, Ill. 44 Frisble D. & Co., Philadelphia, Pa. 45 Rumsey L. M. & Co., St. Louis, Mo. 42 Hoisting Machines.	
36	Clem & Morse, Philadelphia, Pa	
10	Stokes & Parrish Phila. Pa. 44 Yale & Towne Mfg. Co., Stamford, Conn	
9	Whelpley R. H., Chicago, Ill	
27	Dunn J. Cleveland, Ohio	
35,46	Hooks (Cotton & Baie.) New York Handle & Mallet Works, 4-5 E. Houston; Horse Hay Forks.	
39	Waldrop & Sprout, Muncy, Pa	
45	Easex Horse Nail Co., Troy, N. Y	
14	BOUTSE CLUSDS AND FILES.	
30	Heller & Bro., Newark, N. J. Horse Shoes, Makers of. Rhode Island Horse Shoe Co., Providence, P. I.	
36	Rhode Island Horse Shoe Co., Providence, R. I	
13	Hot Blast Stoves. Witherow & Gordon, Pittsburgh, Ps	
14	Bydraulic Jacks, Oudgeon Richard, 24 Columbia, N. y. Watson & Stillman, 470B Grand, N. Y. Ice Cream Freezers.	
13	lee Cream Freezera. Roebuck S. & Co., 164 Fulton, N. Y	
19	Ica Tools, Heartley Geo. W., Toledo, O	
13	Fairbanks & Co., 311 Broadway, New York4	1
6	Hautford Steam Dollar Inspectation as	ı
9 5	Iron. (Manufacturer) Agents. Cox. Jr., Justice & Co., 33 Walnut, Phila. Froment Frank L. 112 John 81, N. Y. Hoffman J. W. & Co., 26 8, 4th, Phila. Levis Henry & Co., Philadelphia, Pa. Lundell Chas. G. (Swedlah), Boston, Mass.	-
12 13	Lundell Chas. G. (Swedish), Boston, Mass	
11	Britton Iron and Steel Co., Cleveland, O	
16	Lundell Chas. G. (Swedish). Boston, Mass. Iron. Manuracturers of. Albany & Rensselaer Iron & Steet Co., Troy, N. Y., 38 Birningham Rolling Mill Co., Louisville, Ky. Birtton Iron and Steet Co., Cholayville, Ky. Birtton Iron Company, Troy, N. Y. Calumet Iron & Steet Co., Chicago., Hl. Carnegte Brox. & Co., Limited, Pittsburgh, Pa., 39 Kirstnatrick & Co., Pittsburgh, Pittsburgh, Pa., 44 Kirstnatrick & Co., Pittsburgh, Pa., 44 Leavitt, C. W., 16t Hroadway, N. Y. Leonard John, 40 West St., N. Y. Montour Iron & Steet Co., Cap. No Delaware ave. Phoenix iron Co., 410 Walnut, Philadelphis Roame Iron Co., Chattanooga, Tenn. Rowtand James & Co., cap. N. Delaware ave., Phila. & Rowtand James & Co., cap. N. Delaware ave., Phila. & Rowtand James & Co., Springfield, Iil. The Prackers. Blak y & Walbaum, Philadelphia. Silve Brokers.	
12	Leonard John, 4to West St., N. Y. Montour Iron & Steef Co., Danville, Pa. Phoenix iron Co., 4to Walnut, Philadelphia	
3	Rome Merchant Iron Mills, Rome, N. Y. Rowland James & Co., cop N. Delaware ave., Phila. c. Rowland Wm. & Harray, Philadeland ave., Phila. c.	
15	Springfield fron Co., Springfield, Iii	
9	Wood Alan & Co., Arch, Philadelphia	
35 2	Iron Brokers,	-
08	Reed Joseph P. & Co., Philadelphia, Pa	-
6.8	Iron. Charcoal. Warm or Cold Blass. Hernsheim L. (Austrian), 20 Nassau, N. Y. Lundell Chas. G. (Swedish. Boston, Mass. 6 Quincy Joha W. & Co., 28 William, N. Y.	-
88866	Iron Commission Merchants, Groome, Roberts & Co. Philadelphia, Pa. 5 Heberson & Co. Philadelphia. 5 Heberson & Co. Philadelphia. 5 Lea J. Tatnall & Co. Philadelphia. 6 Lundberg Gustaf, Rosson, Mpia. 5 Lundberg Gustaf, Rosson, Mpia. 5	- Constitution of the last
888	Lundell Chas. G., Boston Mass39	-
8 8 8 6	Mohr J. J., 40 Walnut. Philadelphia. Pa Wister L. & R. & Co., Philadelphia. Pa Jron Dealers. Aboel Brothers. 190 Bonth, N. Y. Abbott Jere & Co., New York and Boston 30 Bonnell. Botsford & Co., Youngstown, G. Borden & Lovell. 70 and 71 West, N. Y. Carmichael & Emmens. re and 112 Cedar. B. Y. Cooney tianlel F. & Washington, N. Y. Hoathfield, Eyre & Co., London, England. 17 Hoathfield, Eyre & Co., London, England. 17 Hoffman J. W. & Co., 26 & Fourth. Philadelphia. 17 Hubbard Chas., 46 Cliff, N. Y. Judson B. F., 47 and 450 Water, N. Y. Judson B. F., 47 and 450 Water, N. Y. Judson B. F., 47 and 450 Water, N. Y. Lundberg Gustaf, & Eliby, Boston, Mass. 30 Lundell Chas. G. Gwedlish, Boston, Mass. 30 Lundell Chas. Co., 50 William, N. Y. Pullman J. Wesley, Philadelphia, Pa. Value Co., 50 William, N. Y. Wallace Wm. H. & Co., 4 Philadelphia, Pa. Wilson E. H. & Co., 6 Huddon, N. Y. Fron Founders. Bannan Fras. R., Pottsville, Pa.	
8	Abbott Jere & Co., New York and Boston	
0 4 0 0	Cooney thaniel F. 38 Washington, N. Y. Cox Justice, Jr. & Co., Philadelphia, Pa	
000	Heathfield, Eyre & Co., London, England	
000	Judson B. F., 457 and 450 Water, N. Y. Keeley Jerome & Co., Philadelphia, Pa. Lloyd & Lindsay, Philadelphia. Lundberg Gustaf, 38 Kilby Boston, March	
0 0	Lundell Chas. G. (Swedish), Boston, Mass	-
0	Pierson & Co., 24 Broadway, N. Y. Pullman J. Wesley, Philadelphia, Pa Quincy John W & Co. 98 William, N. Y.	
5	Wallace Wm. H. & Co., A'bany and Washington streets, N. Y. Wilson E. H. & Co., Philadelphia, Pa.	
3	Iron Founders. Bannan Fras. R., Pottaville, Pa	-
5	Iron Mines. Croton Magnetic Iron Mines, 39 Park row, N. Y37 Iron. Pig. Importers of. Abbott Jere & Co. (Swedish), New York & Boston of	
5	Hubbar I, Chas., 46 Cilif. N Y Lee James & Co., 72 Pine, N. Y Lundberg Gustaf, Boston, Mas. Lundell, Chas. G. (Swedish) Boston, Mas.	-
2	Iron, Pig. Importers of. Abbott Jere & Co. (Swedish), New York & Boston59 Hubbar I, Chas., 46 Cliff. N. Y. Lee James & Co., 72 Pine, N. Y. Lundborg Fustaf, Boston, M. as. Lundborg Fustaf, Boston, M. as. Lundborg Fustaf, Boston, M. as. Kichardson, J. O., Philadelphia Ross, James W. Chicago, Ill. Wessels Ed. J., 17 Codar, N. Y. Williamson James & Co., 6 Wall M. Y. Lan. Niesel, Manufacturers, 44 Lan. Sheet, Manufacturers, 44 Lan. Sheet, Manufacturers, 44 Lan. Sheet, Manufacturers, 45 Lan. Sheet, 45 Lan. She	
	Winamon amera & O., og Wali N. Y. Iron. Sheet. Manufacturers of. Jersey City Galvanising Co., Jersey City, N. J. 4 Lefterts, Marshall & Co., o Beskman, N. Y. Wood W. D. & Co. Pittsburgh, Fa	
	Morris, Wheeler & Co., 14 Cliff, N. V	
1	Jack Screws. Millers Falls Co., 74 Chambers, N. Y	
	Lanterns, Manufacturers of. Diets R. E., 4 and 46 Fulton, N. Y	
	Harrington E. & Son, Philadelphia, Pa	
	Lawn Mowers. Carr & Hobson. 47 Cliff, N. Y. Chadborne & Coldwell Mfg. Co., Newburg, N. Y 28 Mast, Foos & Co., Springfield, O	
-	Lemon Squeezers. Dean Wm. B. 49 Murray, N. Y	
	Lemon Squeezers. Dean Wm. B. 48 Murray, N. Y	
	EACYCING TO A A A A A A A A A A A A A A A A A A	
	Durrie & McCarty, 97 Chambers, N. Y	
1	Comstock Wm. 1., o Antor Piaco, N	
-	warming the farme	
-	Add John, New Haven. Conn	-
-	Dodge, Heller & Lyons, Newark, N. J. 8 Forsaith S. C. & Co., Manchester, N. H	1
1	Pittsburgh Mig. Co., Pittsburgh, Pa. 43 Purdy Machine Co., Cleveland, O. 44 Bellers Wm. & Co., Phila., and 79 Liberty, N. Y. 44	1
	Stow Flexible Shaft Co., Limited, Philadelphia	170
		78 78
-	Machinists' Tools and Supplies, Blaisdell P. & Co., Worcester, Mass	
	Machinistar Tools and Supplies, Blaisdoil P. & Co., Worcester, Slass, 43 Eynon W. R. & Sons, Cleveland, O	101 10

E.	81
Metals. Detroit Copper & Brass Rolling Mills, Detroit, Mich. 2	Scrapers, Road. Austin F. G., Skannateles, N. V.
Detroit Copper & Brass Rolling Mills, Detroit, Mich. 2 Detroit Copper & Brass Rolling Mills, Detroit, Mich. 2 Diokerson, Van Dusen & Co. 20 and 31 Cliff. N. V. 2 Merchant & Co. Philadelphila, Pa. 22 Naylor & Co. 29 John. N. Y. 38 Northrop A. C., Waterbury, Conn. 38 Pheips, Dodge & Co. Cliff. bet. John & Fulton, N. V. 2 Phosphor Bropps Swalling Co. Limited ver. Arch.	Scrapers, Rond, Austin F. G., Skaneateles, N. Y
	Billerbeck J., 12th and Venango sts., Philadelphia 13 Bruce Geo, W., 1 Platt, N. Y
Purves A. & Son, cor. South and Penn, Phila 5	Philadelphia screw Co. Philadelphia, Pa 27
Metaliurgists. Booth, Garrett & Blair, 919 Cnant, Philadelphia	Wiley & Russell Mrg. Co. Greenfield. Mars
Willson Bros., Easton, Pa	Shaft Carriers. Taylor & Chailen, Birmingham, Eng
Wine Lamps.—Leonard Brov., Scranton, Pa27 Wineral Wood, U. S. Mineral Wood Co., 16 Cortlandt, N. Y	Shafting. Makers of. Cresson Geo. V. Philadelphia, Pa. 45 Poole & Hunt, Baltimore, Md. 45 Seiters Wm. & Co., Phila., and 7 Liberty, N. Y. 45
Minera' Candles, Makers of, James Boyd's Sons, 10 and 12 Franklin, N. Y 12	Shears and Scissors. J. Wiss & Sons, Newark, N. J
Nolding Unchives. Drummond Mfg. Co., Louisville, Ky	Shears, tron.
Molding Mand. Emerick J. A. & Co., 1986 Beach, Philadelphia, Pa. 3 Paxson J. W. & Co., 514 Beach, Philadelphia, Pa. 5 Schenectady Molding Sand Co., Schenectady, N.Y., Whitehead Bros., 515 and 517 W. 15th, N. Y	Peeriess Funch & Shear Co. 38 W. Dey, N. Y
Whitehead Bros., 515 and 517 W. 15th, N. Y30 House Traps.	The state of the s
Mouse Traps. Ripley Mr. Co. Unionville, Conn. 27 Smith & Egge Mr. Co. Bridgeport Conn. 32 Nalls.—E. & G. Brooke Iron Co., Birdshaw, Pa. 7	Ship Chandlery, Creed Geo, H., 103 Reade, N. Y.
Natis.—E. & G. Brooke Iron Co., Birdshaw, Pa	Shovels, Spades and Scoops, Husey, Blons & Co., Pittsburgh, Pa
Jefferson Iron Works, Steubenville, O	Clark, Bunnett & Co., 162 and 164 W. 27th, N. Y 27 Sieves. Milton Sieve Co., Limited, Milton, Pa
Ross W. K., 97 Chambers, N. Y.	Skates, Roller Henley M. C., Richmond, Ind
Vail Machinery. Pittsburgh Mfg. Co Pittsburgh, Pa	Smeiting Works. Martin Reynolds, Brooklyn, N. Y
Hanson, Van Winkle & Co., 92 Liberty, N. Y 37 The Zucker & Levett Chemical Co., 540 to 544 West 16th, N. Y	Bergen Port Zinc Co 13 Burling Slip. N. Y 3
Torway Shapea, Rollers of. Naylor & Co., 99 John. N. Y	Manning & Squier, 11, Liberty, N. Y
Rowland win & Harvey, rabatord, Philadeliphia 40 (uta. Bolts, etc., Makers of. Allentown Polling Mill Co. Allentown Pa. 5 Empire Nut Co. Pittsburgh, Pa. 3 King & Perot, Philadeliphia, Ps. 44 New Haven Nut Co. Westville, Conn. 43 Parkes Thos. Buffaio, N. Y. 33 Rhode Island Tool Co. Providence, R. I. 57 Russell. Burdsall & Ward. Port Chester, N. Y. 46 Standard Nut Co. Pittsburgh, Ps. 45 Standard Nut Co. Pittsburgh, Ps. 45	Springs, Steel Spiral. Cary & Moen. 24 W. 20th. N. Y. Rowland wm. & Harvey. Frankford. Phils
King & Perot, Philadelphia, Pa	Steam Hammers. &c Makers of. Dienelt & Eisenhardt, Philadelpnia, Pa44 Dudgeon Richard, 24 Columbia, N. Y44
	Steam Pumps. &c Manufacturers of. McGowan Jonn H. & Co., Cincinnati, O
Chase Geo., 107th and Harlem River. N. Y	March from contract
Indiacks. Fairbanks & Co., 311 Broadway, N. Y	Carr J. & Riley 3c Gold, N. Y
Jenkins Bros., 71 John, N. Y32	Steel Importers. Abbott Jere & Co., New York and Boston 30 Carr J. & Riley 30 Gold, N. Y. 38 Hobson Francis & Son, or John, N. Y. 38 Montgoniery & Co., ros Fulton, N. Y. 36 Montgoniery & Co., ros Fulton, N. Y. 36 Pierson & Co., 24 Broadway, N. Y. 4 E. H. Wolff & Co., 94 John, N. Y. 98 Wolfman & Mickerts, St. Louis, Mo.
Bullings Taylor & Co. Cleveland O	Hubbard Chas., 40 Cliff, N. Y
aint Enamel. Enamel Paint Co., Cleveland, O	Steel Manufacturers.
Howson & Son. Phila., and Washington, D. C40	And 1800, Du Puy & Co., Pittsburgh, Pa
Knight H. W., Seneca Falls, N. Y	Chrome seet works, brooklyn, s. 1. 28 Cleveland Crucble Steel Co., Cleveland O
Phospher Bronze. Phosphor Bronze Smelting Co., Limited, 512 Arch Philadelphia	Linden Steel Co. (Lu.), Fittsburgh, Fa
Picks. Makers of. Pierson & Co 2s Broadway. N. Y	Miller, Metcalf & Parkin, Pittsburgh 38 Moss F. W. 80 John, N. Y 38 Naylor & Co., 90 John, N. Y 38 Pangaryana Steel to 68 S. 4th, Phila 6
lig fron. Bond. Parsons & Co., 10: John. New York	Naylor & Co., og John, N. V. Pennsylvania Steel (O., z68 S. 4ch, Phila. Philadelphia Steel Forge, Philadelphia, Pa. Rowland Wm. & Harvey, Frankford, Phila. 6 Shoenberger & Ce., Pittsburgh, Pa. Smith, Sutton & Co., Pittsburgh, Pa. Binger, Nimick & Co., Pittsburgh, Pa. Wutthbac & Son Sheffield, England, o
Quincey J. W. & Co., 68 William. N. Y	Smith, Sutton & Co., Pittsburgh, Pa. 38 Singer, Minick & Co., Pittsburgh, Pa. 6 Spencer Matthlas & Son, Sheffield, England, 10
Ig Iron Breaker. Blake Crusher Co., New Haven, Conn	Spencer Matthlas & Son, Sheffield, England
Pancoast & Maule, 243 & 245 53d st., Philadelphia33	Steel, Pheet. U. S. iron and Tin Plate Co., Demmier P. O., Allegheny Co., Pa
Cox & Sons, Philadelphia, Pa	Steel Spiral Springs, Manufacturers of. Carv & Moen, 234 W. 29th, N. Y
ipe. Water and Gas. Makers of. McNeul A. H., Burlington, N. J	Sicel, Teel —Brown & Co., Pittsburgh, Pa
Reading Iron Works, Philadelphia, Pa	Stocks and Dies. Wiley & Russell Mrg. Co., Greenfield, Mass
Wyckoff A. Elmira, N. Y	Ansonia Brass and Copper Co., 19 & 21 Cliff, N. Y 229 Stove Mepnirs, -Metaner W. C., Chicago, Ill 8
Stanley Rule and Leves Co., 39 Chambers, N. Y 9	Stove Trucks. Tucker Alarm Till Co., Indianapolis, Ind 10 Strops, Hazor.
laners. Brettell Geo. E., Rochester, N. Y	J. K. Torrey Razor Co., Worcester, Mass
Hall, Elton & Co., 47 E. 13th N. Y	Cobb & Drew, Plymouth, Mass
ower Hammers.	l'aps and Dies. Carpenter J. M., rawtucket R. I
Reases. Power. Makers of. Beecher & Peck, New Haven, Conn. 40 Bliss E. W., 167 Pivmouth, Brooklyn. 44 Merriman A. H., West Meriden, Conn. 44 Peerless Punch & Shear Co., 26 V. Dey. N. Y. 45 The Stiles & Parker Press Co., Middletown, Conn., 64	Purvis R. C., Philadelphia, Pa
Merriman A. H., West Meriden, Conn	Testing Machines. Olsen Tinius & Co., Philadelphia, Pa
ressure Regulators. Curtis Regulator Co., Boston, Mass	Tire Ups-Rers. Little Giant Mfg. Co., Millport. N. Y
rinting Presses. Kelsey & Co., Meriden, Conn32	Armstrong F., Bridgeport. Conn
uileys. Meiart Pat. Pulley Co., St. Louis, Mo	Trimmer, Tree and liedge. Lee E. S. & Co., Rochester, N. Y. 10 Trucks, Manyacturer og. Richié Bros., 9th, above Master, Phila
Clark Bros., Belmont. N. Y	Tube scrapers. Chalmers Spence Co., 23 John, N. Y
	Charles W. Re. Lea & Co. Chicago 111
Welch. A Lambertville. N. J	Charles B. Beslev & Co. Unicago, III
adi · I Dril's. Hilles & Jones. Wilmington Del45	Turning (Wood). Ripley Mrg. Co., Unionville, Conn
alla. 1ron and Steel. Allentown Rolling Mill Co., Allentown, Pa	Morse Twins Drift & Mach. Co. N. Bedford, Mass. 40 Valves, Giss, Water and Steam. Luciow Valve Mrg. Co. Troy N. Y. 43 The Eddy Valve Co., Waterford, N. 43 Vises. —Booker Hermann & Co., 101 Duame, N. 43 Vises. —Booker Hermann & Co., 101 Duame, N. 41 Vises. —Booker Hermann & Co., 101 Duame, N. 41 Vises —Booker Hermann & Co., 101 Duame, N. 41 Vises —Booker Hermann & Co., 101 Duame, N. 41 Vises —Booker Hermann & Co., 101 Duame, N. 41 Vises —Booker Hermann & Co., 101 Duame, N. 41 Vises — Booker Hermann & Co., 101 Vi
Cleveiand Roiling Mill Co. Cleveiand, O	Howard Iron Works, Buffalo, N. Y
Allentown Holling Mill Co., Allentown, Pa. - Cambria irrop Co., Johnstown, Pa. - Carnegle Bros. & Co., Umited, Pittsburgh, Pa. - Carnegle Bros. & Co., Umited, Pittsburgh, Pa. - Carnegle Bros. & Co., Umited, Pittsburgh, Pa. - Carnegle Bros. & Co., 13 New, N. Y. - Second Co., 13 New, N. Y. - Carnegle Bros. & Co., 13 New, N. Y. - Carnett C. W., 161 Broadway, N. Y. - Carnett C. W., 161 Broadway, N. Y. - Pittsburgh Bessemer Steel Co., 12 Pittsburgh, Pa. - Carnett C. Scranton Steel Co., 12 Broadway, N. Y. - Carnett C. Scranton Steel Co., 13 Poradway, N. Y. - Carnett Co., 15 Broadway, N. Y.	Se-man & Co. Willhort & I
scranton Steel Co., 56 Broadway, N. Y	Water toolers, Jewett John C. & Sons, Buffalo, N. Y
aliway Supplies. Fox & Drunmond, 68 Wall. New York. 4 Fox & Drunmond, 68 Wall. New York. 4 Sesup F. W. & Co., cy. Liberty. N. Y. 3 Setcatf Paul & Co., Pittsburgh, Pa. 38 L. M. Rumsey Mig. Co., St. Louis, Mo. 42	W neets, Hallrong. Bowler & Co., Cleveland, O
akes.—Halteman W. A. & Co. Dayton. O30 The F. F. Adams Co., Eric. Pa30	White I and
J. B. Torrey Razor Co., Worcester Mass lo	Colgate Robi. & Co., 287 Pearl, N. Y. 37 Jewett John & Sons, 122 Front, N. Y. 37 Lewis John T. & Bros. 20 S. Front Phila. Fa. 37 Salem Lead Co., Salem, Mass. 37
efrigerators. ewett John C. & Sons, Buffalo. N. Y	Window and Door Screen Corners, Forer Mrs. Co., Burlington, Vs. Window Cleaners, Perfection Window Cleaner Co., Chicago, Iil
Ponte Roin Holder Co. Conton Ohio	Louiderback Edw n & Co Philadelphia Da
ivets. Blake & Johnson, Waterbury, Conn	Hammond W. S., Lewisberry, Pa
Palis Rivet Co., Cuyahoza Falis, O 40 Bilmor Wm., of Wm., Baltimore, Md	Hugunin R. H., Hartford, Conn
Nets. Slake & Johnson, Waferbury, Conn. Jlark & Cowles, Plainville, Conn. Steller & Cowles, Plainville, Company,	Wire Cloth. Wire Cloth. Wire Cloth. Wire Cloth. Wire Cloth. Wire Cloth. Wire Lose Office. Wire Lose Office. Wire Admiracturers of American Wire Co., Cleveland, Ohio.
ock Breakers. Slake Crusher Co., New Haven, Conn	Cambria Iron Co., Johnstown, Pa
rates from works, Chicago, Ill	Wire, Menufacturers of. American Wire Co., Clevelsind, Ohlo
not Brackets. letsel W. H. & Co., Syracuse, N. Y	Trenton Iron Co., Trenton, N. J. Washburn as Moen Mrk. Co., Worcester, Mass., 2 Worlman & Mickerts, St. Louis, Mo., 3 Worcester Wire Co., Worcester, Mass., 2
coding.—Garry Iron Roofing Co., Cleveland, O27 loser & Thompson, Cleveland, O	WILE TROUGH. MURUICULTURES OF
ales, Manufacturers of tanley Rule and Level Co., 29 Chambers, N. Y 9 d irons.—Enterprise Mfs. Co., Philadelphia33	E. T. Barnum Wire and Iron Works, Detroit Mich. 31 Gilbert & tennett Mig. Co. 27: Pea. l. N. Y. 12 The Fred. J. Meyers Mig. Co., Covington, E. 30 National Wire and Iron Co., Detroit, Mich. 36 The Wire Goods Co., Worcester, Mass. 10 Wire Naits.—4P. Nait Co. Clevelard. O. 17 A. Field & Sons, Taunton. Mass Wire Mope, Iron and Steet, Makers. Broderick & Bascom. St. Louis, Mo. 2 Laschen A. & Son, St. Louis, Mo. 2 Lischen A. & Son, St. Louis, Mo. 32 Wire Brotet thers. 32 Wire Stretchers. 34 Wire Stretchers. 34 Wire Stretchers. 34 Wire Stretchers. 34 Wire Stretchers. 35 Wire Stretchers. 34 Wire Stretchers. 35
sh Holders. Villes H. A., Philadelphia, Pa	Wire Naits, -iP. Nail Co. Cleveland O. 17 A. Field & Sons, Taunton, Mass. 17
Ws. Makers On., Williamsport, Pa	Broderick & Bascom, St. Louis, Mo
Vheeler, Masden & Clemsen Mig. Co., Middle town N. Y	Samson Novelly Voels Dallalla III
arry W. B., Indianapolis, Ind. 28 inston Heury & Sons, Phila. 40 ichardson Saw Works, Newark, N. J. 29 kheeter, Masdden & Clemsea Mrg. Co., Middle town, N. Y	Wood-Working Machinery. Goodeli & Waters, Philadelphia, Pa
w Vises Seneca Mfg. Co., Seneca Falls, N. Y., 10 ales. Manufacturers of. uffalo Scale Co., Buffalo, N. Y	L. M. Milliney and Co. Sections, 200 Wrenches, Manufacturers of. Bennis & Call Halv. & Tool Co., SpringBeld M to 353 33. Coes A. & Co., Worcester Mass. 10 Coes L. & Co., Worcester, Mass. 25 Wringers - Alexander T. J. Boston, Mass. 7
uffalo Scale Co., Buffalo, N. Y	WringersAlexander T. J., Boston, Mass



SHOVELS, SPADES

SCOOPS,

HUSSEY, BINNS & CO.,

PITTSBURGH, PA., U. S. A.

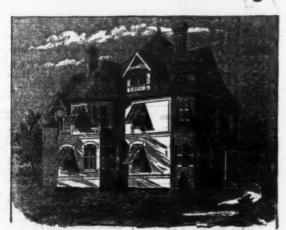
NEW YORK AGENCY:

McCARTY. DURRIE

97 CHAMBERS STREET,



The "Automatic" Blind Awning Fixture



The very best blind hinge and a perfect awning fixture. No cloth to tear and wear out. No iron frames to shake and rattle. Blinds instantly converted to awnings. Awnings instantly converted to blinds. No skilled labor necessary to apply them. A child can operate them. Indispensable for summer hotels and dwellings. Rooms always cool and shady. Many thousands in successful operation. Models furnished to architects.

F. O. NORTH & CO.,

276 Devoushire Street, - -

BOSTON, MASS.

CARRIAGE AND WAGON HARDWARE

LARGEST VARIETY MADE BY ANY HOUSE.



SEND FOR NEW CIRCULAR OF WAGON HARDWARE, JUST ISSUED.

FORGED WROUGHT IRON CLEVISE AND BOLT. N. B .- This is the Strongest and Best Clevise ever offered to the Trade.

THE E. D. CLAPP MFG. CO., Auburn, N. Y.

LOVEJOY DRAKE,

Manufacturers' Agents,

101 READE STREET, NEW YORK.

Iron & Chain, Heavy & Wagon Hardware RAILROAD & BUILDERS' SUPPLIES, &c.

ARTESIAN WELL MACHINES.

For our Fu'l Page Advertisement, See First Issue of Each Month.

Corrugated, Crimped, Bead, Iron Shingles.

MOSER & THOMPSON, ROOFING AND SIDING Send for Circular and 28-32 River St., Cleveland, O. Price List No. 26.





FOUNDRYMEN'S METALLIC Pattern Letters and Figures, duesd prices. Mand. by N. W. Karght, Genera Falls, N.Y. General Foundry & Iron Work.



THE CIANT PAD LOCK. THE SMITH & EGGE MFG. CO.

(Centennial Award.)

Superior in Every Respect.

**Also is note of the best selling Locks in the metafords the dealer a large profit. It is there strongly made—of the best material—very on appearance, and every Lock is warrantic. earance, and every Lock is warranted. cited. Address as above och Box 170%. Bridgeport, Cons FLAGLER FORSYTH & BRADLEY 298 Broadway N. Y.

WORTHINGTON & SONS

MANUFACTURERS OF

CRINDSTONES

FOR ALL PURPOSES,

Scythe Stones and Mounted Crindstones.

Cor. Front and River Sts., CLEVELAND, OHIO.

THE BOLTON STEEL CO.

MANUFACTURERS OF

THE BEST REFINED

AND OTHER FINE GRADES OF

CAST STEEL.

CANTON STEEL WORKS, CANTON, OHIO.

STEAM CHEST SEAT MILLING MACHINE



L. B. Flanders Machine Works No. 1025 Hamilton St., Philadelphia, Pa.

D. STEELE & SONS MFG. CO.,

POTTSTOWN, PA.

RAILWAY CARS & BRIDGE BOLTS. Car, Architectural and Bridge CASTINGS,

MELYN GRADE BRIGHT TIN.

In view of the fact that brokers and others are quoting this grade and not naming Brands they propose to deliver, we desire to notify the trade that any orders received by this house for Melyn Grade will be filled by the following brands:

P. S. & CO. MELYN. E. C. C.

> L. P. L. TALBOT.

We carry in stock the best, also the cheapest, brands of bright and roofing (charcoal and coke plates), and those wish. ing a superior quality of bright plates to Melyn grade can be supplied with such brands as DAFEN, KILLEY, &c. (extra coated plates). It is our purpose to give our customers the very best plate that can be made if they desire to purchase same.

MERCHANT & CO.,

Importers of Tin Plates, Sheet Iron, Metals, &c.,

525 ARCH and 520 CHERRY STS..

CLIFF and BEEKMAN STS.,

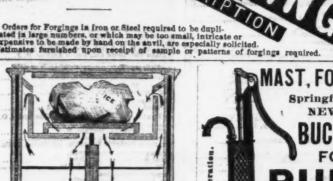
PHILADELPHIA.

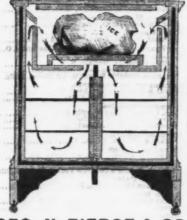
NEW YORK.

CHICAGO FORGING CO.

No. 14 Metropolitan Block, CHICAGO, ILL.

ANSON STAGER.



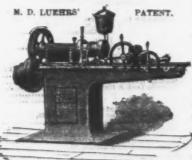


GEO. N. PIERCE & CO., BUFFALO, N. Y., York Office, - 195 Water Street,

MANUFACTURERS OF BIRD CAGES and REFRIGERATORS. Send for Illustrated Catalogue and Price Lists

Chicago Stamping Co., Chicago, Ill., Sickles, Preston & Co., Davelport, Iowa. Culucinasi Tin and Japan Co., Cincianati, Onio. Kennedy, Spaulding & Co., Syrsense, N. Y. Weaver & Goss. Rochester, N. T. E. A. Burrows & Co., Troy, S. Y.

ACME" BOLT CUTTERS WITH CAP DIES.



le Automatic Boit Cutters. Single Boit Cutters, o 4 in. Hapid Boit Cutters. Nut Tappers, ½ in. in. Rapid Nut Tappers, ½ 4 and c Spindles, leaders, four different styles. Boil Pointers,

NOYELTY IRON WORKS CLHYRLAND, OHIO,



Has Porcelain Lined and

Brass Cylinders.
Is easily set. Is the Cheapest and Best Force Pump in the world for Deep er Shallow Wells. Thousands in use in every

part of the United States. Never freezes in winter. Send for CIRCULAR and PRICES, giving depth well, to

MAST, FOOS & CO., Springfield, Ohio.



THE JENKINS STANDARD PACK-ING is acknowledged by users as the Best in the world. Unlike all other Packings, the Jenkins Standard Packing can be made any thick-ness desired in a joint by placing two or as many thicknesses together as desired, and following un-icing it mileavirus in place and following un-icing it mileavirus in place and following uninitianceses regether as desired, and rejecting up joint it vulcanizes in place and becomes a setal of itself (it is frequently called Jenkins Metal) and will last for years, as it does not rot or burn out Avoid all initiations, as a good article is always subject to cheap imitations. The genuine has stamped on every sheet. "Jenkins Standard Packing," and is for sale by the Trade generally. Manufactured only by

JENKINS BROS., PROPRIETORS JENKINS PATENT VALVES, PACKING, &C.

71 JOHN ST., NEW YORK,

but also Por (REMI F

Dish Bro

Hend

This pos ead amend bemicel ci btainable, For par

MAL



Wrought Iron Butts, Hinges DOOR BOLTS,

Plain, Japanned, Bronzed and Plated. FACTORIES: WAREHOUSE:

New Britain, Connecticut.

Shal-

every

and

CO.,

14

CK-

g un talof

nd"

9

79 Chambers St., New York.

DEPARTMENT OF PUBLIC WORKS.

National Meter Co.,

JOHN C. KELLEY, President,

No. 51 Chambers St., NEW YORK.

Bemis & Call Hardware & Tool Co. PATENT COMBINATION WRENCH.

These Wrenches are made from the bast of Wrought Iron, with Steel Head and Jaw, case-hardened shroughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Cembinations of a regular Nut Wrench thus making a combination which has no

For Circulars and Price List, address REMIS & CALL HARDWARE & TOOL COMPANY, Springfield, Mass.

PARAGON FLY TRAPS.

Dish Covers, Green Wire Cloth, Sieves, Muzzles, Bird Cages, &c.

Bromwell Brush and Wire Goods Co..

CINCINNATI, O.

W. H. QUINN & CO., 99 Chambers Street, New York.

Henderson's Patent Refractory Compounds.

THE SILICA BRICK OR COMPOUND. This compound is adapted to all uses to which silica and fire-clay brick are used. Its advantages are reduction to low cost of common red brick for labor and materials; neither expands nor contract from molding to highest temperature. Infusibility at any temperatures used in the arts. Self-baking or burned in the use. Can be made in any locality where sand is obtainable. No outlay of capital for apparatus. Made by unskilled labor at place where used. May be used in bulk by ramining behind a core, or moided into brick. Repairs are made by patching the fire-worm surface with the same compound. Is adapted for molding steel castings,

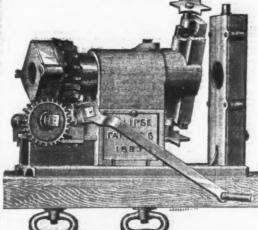
THE LIME OR MAGNESIAN LIME COMPOUND.

This possesses all of the above advantages, with the addition of being better adapted for silver and lead amelting furnaces, not and steel converting furnaces, and other uses where greater wear or claumical charges are produced by use of silica, and of being made in localities where said is not obtainable, and of being below cost of red brick for labor and material.

For particulars as to manufacture and licenses, apply to

JAMES HENDERSON, Agent, Bellefonte, Centre Co., Penn.

Junior" Eclipse Pipe-Cutting Machine WINDOW



Eclipse" Machine, and is so simils serve for the "Junior" also. It meets the requirements of those who have use for a Screwing Machine light enough to be readily carried about, sufficiently powerful in its gearing (18 to 1) to work easily, and strong enough to bear rough usage. All of these points, with the very important one of MODERA. In COST, are to be found in the "Junior" Eclipse Machine.

It will cut off and thread Pipes from ¼ to s-inch, inclusive; can be erected on any fence, box or plank in five minutes by simply boring two ¼ holes, and weighs, complete, about 125 pounds. It has no complicated parts and nothing to break or get out of order, and will do the work of a tool costing twice its price.

tool costing twice its price.
We offer it, as also the large size We offer it, as also the inarge else-"Eclipse" (cutting pipes 2½ to 4 inch), with the understanding that if not found satisfactory after a fair trial it may be returned to us within thirty days and the pur-chase money will be refunded.

PRICE, Complete with Dies

MAULE,

MELLERT FOUNDRY & MACHINE CO., LIMITED.

(Works Established at Reading. Pa., in 1848.)
MANUFACTURERS OF

Also Flange Pipe, for Steam or Water, of all sizes used. Special Castings, such as nches, Bends, Reducers, Sleeves, &c. Stop Valves, Fire Hydrants, Retorts, Lamp Posts, &c.

The Improved Canada Turbine Water Wheel.

MACHINERY AND CASTINGS FOR

Furnaces, Rolling Mills, Mining Pumps, Hoists, &c.

CAR CASTINGS, GIRDERS, COLUMNS, BRACKETS, IRON RAILING, &c., &c.

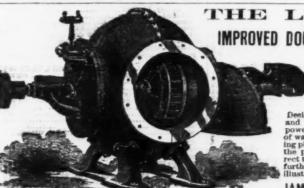
CENERAL OFFICE AT READING, PA.

ROOF CRESTING AND FINIALS.

Iron Shutters, Window Guards, Jail Work, &c., AND OFFICE RAILINGS.

WIRE and IRON WORK of Every Description

THE E. T. BARNUM WIRE & IRON WORKS. Detroit, Mich., U. S. A. THE LEFFEI



IMPROVED DOUBLE TURBINE WATER-

Designed for mining purposes and the utilization of water and the utilization of water power with limited quantity of water and high heads. Be-ing placed on horizontal shaft, the power is transmitted di-rect to shafting by beits. For further information and free

JAMES LEFFEL & CO.

Springfield, Ohio, or 110 Liberty St., N. Y



Adjustable Jaw. Stationary or Pat. Swivel Bottoms. PEERLESS" SWIVEL PIPE GRIP

PRENTISS VISE CO.. 23 Dey Street, New York.
SOLE PROPRIETORS. SEND FOR CIRCULAR

AT X DI M'F'G MANUFACTURERS OF BUILDERS'HARDWARE BUFFALO, N.Y.

V. G. HUNDLEY, NORTH CAROLINA HANDLE CO.



Handles and Spokes, NEW YORK. To Reade Street and 97 Chambers Street, "HARDWARE COMMISSION MERCHANT.

RHODE ISLAND HORSE SHOE CO.,

Horse, Mule & Snow Shoes of the Perkins Pattern.

Works at Valley Falls, R. I. Office, 31 Exchange Place, Providence, R. I. C. H. PERKINS, Gen'l Manager. R. W. COMSTOCK Secretary F. W. CARPENTER, President



HOG AND PIG RINGER and RINGS.
Only single Ring in the market that closes the outside of the

30. Rings, un. 110. Helders, 710. Muskers, 150. CHARLEMAS, BENENG & QUINZAN, Suplusive Magnizaturers, Docasur, M.

PERFECTION



CAUTION, IMPORTANT.

The great demand for and rapid increase in the popularity of the PERFECTION WINDOW CLEANER has influenced unprincipled parties to offer for sale an inferior and worthless imitation. We therefore caution all such persons and the trade generally against the manufacture, sale or use of any RUBBER WINDOW CLEANER not bearing our stamp, as all others are infringements, against which we shall protect ourselves under the rights granted us in U. S. Patents to the full extent of the law.

The only perfect glass or Window Cleaner vet devised. Has been constructed with a combination of an Elastic Cleaning Edge, and a yielding cushior or support. We own all the patents embodying one or both of these principles, and, by combining them, offer you a perfect Window Cleaner. They are made of the very best material, and are cheap, useful and durable.

Beware of all inferior and fraudul-nt imitations. Buy only the "PERFECTION" and you escape all infringements.

PERFECTION WINDOW CLEANER CO.,

232 La Salle St., CHICAGO, ILL.

UNION BOLT AND NUT WORKS. THOMAS PARKES, MARUFACTURER OF

MACHINE BOLTS, NUTS AND RIVETS Ot All Kinds. Office and Works

204 206 & 208 Chicago St., BUFFALO, N. Y.



Grindstones, Emery, &c.

Walter R. Wood, **GRINDSTONES**,

Berea, O., Nova Scotia, & other brands. 983 and 985 Front Street, New York.

GEO. CHASE,



Of all description. 107th Street and Harlem River, lend for Illustrated Price List. NEW YORK.



OHIO GRINDSTONE COMPANY.

H. H. CLOUGH, Prest. J. M. WORTHINGTON, Secry JAMES NICHOLL, V. Pt. E. K. MUSSEY, Treas. Manufacturers of

Of All Kinds.

127 Superior Street, CLEVELAND OHIO.

New York Wholesale Prices, May 9, 1883.

HARDWARE

HARDWARE.	Brits, Wrought Brass	Deg Collars. dis 308 Embossed Gilt. dis 308 Eather dis Brass. dis
A nvils. A nvils. Eagle Anvils American	Hutts, Wrought Brass, dis 56 ktok Cast Brass, Tiebout's dis 25 ktok Cast Brass, Trebout's dis 25 ktok Cast Brass, Loos Joint dis 25 ktok Cast Brass, Loos Joint dis 26 ktok September dis 26 ktok Fast Joint, Eroad dis 46 ktok Loose Joint dis 46 ktok Loose Joint dis 46 ktok Loos Joint dis 46 ktok Loo	Door Springs dis Door Springs dis
Aright's IIC @ 115 Armitage's Mouse Hole	S Fast Joint, Lroad	Eee Rod dis Gem (Coil) :
Anvil Vise and Drill. Millers Falis Co., \$18.00	Mayer's Hinges dis 60&r	No. 7, Large Japanned 4 dos \$4.00 / 0.5 No. 2, Medium, Japanned 4 dos 2.75 dis 50 & 1 No. 2, Small, Japanned 4 dos 2.00 / 1.0
Augers and Bits. onn. Valley hig. Co. Ouchass hig. Co. IE. Jennings & Co. dis 45&to. dis 45&to.	Loose Pin, no Acorn dis soun Loose Pin, Acorns d's soun Loose Pin, Acorns, Japanned d's cours Loose Pin, Acorns, Japanned, Plaved Tips. dis 6ctr. Loose Pin, Acorns, Japanned, Plaved Tips. dis 6ctr. Past Joint, Lt. Narrow dis 5ctr. Past Joint, Lt. Narrow dis 5ctr. Past Joint, Enond. dis 5ctr. Loose Joint, Broad dis 5ctr. Loose Joint	Warner's dis
E. Jennings & Co	Fast Joint, Lt. Narrow dis socks Fast Joint, Et. Narrow dis socks Fast Joint, Broad dis socks Loss Joint Broad dis socks Loss Joint Broad dis socks	No. 7, Large \$\footnote{1}{\text{No. 7, Large \$\footnote{1}{\text{No. 1, \$\footnote{1}{\text{2, \$\footnote{1.50}; 2, \$\footnote{2}{\text{3, \$\footnote{1, \$\footnote{1}{3, \$\footnote{1,
riswold	Table Butts, Back Flaps, &c	Philadelphia
Dies ang. Co.	Loose Pin, Wrt dis 55&te. Locse Pin, Light dis 50&te. Spring Hinges:	Herouies dis Drawing Knives. dis 65& Arington Edge Tool Co. dis 65&
wis' Patent Single Twi-tdis 45 188eli Jennings' Auger, Dewel, Machine-Dowel and Hand Rail Kitsdis 16&10&10	Sabin Mfg. Co.'s Double Acting. dis 3 Union Spiral Spring, Japanned dis 2 Union Spring Hinge Co.'s dis 25	Perusing Knives.
ussell Jennings' Augers dis 16%&10&10&10 18sell Jennings' Car and Machine Bits, Boring Ma- chine and Millwrights' Augersdis 25&10&10&10	American Spring Hinge Co.'s. dis 3. Gem Spring Hinges. dis 36 Barker's Double Acting. dis 26	Radley's dis
eel Mg. Co.'s Jennings' Bits	Union Mrg. Co. dis 25 Bommer's dis 25 Buckman's dis 26 Buckman's dis 26	Douglas dis 65&: Globe Mfg. Co. dis 65&: Drills and Drill Stocks.
ussell Jennings' Auger, Dewel, Machine-Dowel and Hand Rail litts. dis régrotions ussell Jennings' Augers. dis réfégarcèroèro in susell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers. dis 252-08-08-08-08-08-08-08-08-08-08-08-08-08-	Loose Pin, Wrt.	brills and Drill Stocks. Blacksmiths'
ollow Augers, Ives	Blind Butts, Palmer. dis 45& to Blind Butts, seymour. dis 7 Blind Butts, Shepard's "Double Locking." Nos.	Breast, Mileon's
oliow Augers, Stearns' Adjust. \$\varphi\ dz. \$48—dis 20&10 ollow Augers, Ives' Expansive, each \$4.50—dis 30&10 ollow Augers, Universal Expan., each \$4.50—dis 20	Shepard's Standard, Nos. 4 and 5	Ratchet, Ingersoll's dis
ollow Augers, Feench, Swiff & Co. dis 25 ollow Augers, Boundass'	Blind Butts, Huffer dis & Blind Butts, Cark's, Nos. 1, 3, 5. dis 50&10410	Ratchet, Moore's Triple Action
puble Cut Gimlet Bits, Shepardson's dis 40 puble Cut Gimlet Bits, Ct. Valley Mfg. Co, dis 30&10 puble (ut Gimlet Bits, Hartwell's dis 60	Blind Butts, Reading's Gravity discompanies Clark's Improved Shutter Hinge, Nos. o. 1, 1%; 2, 26.	Wilson's Drill Stocks. dis a Automatic Boring Tools. each, \$2.25, dis a Drill Chucks.
ouble Cut Gimlet Bits, Douglass'	Humson, Beckley & Co.'s, Nos. 1 and 2dis 60 Humson, Beckley & Co.'s other Nosdis 60% & Co.	Drill Chucks. Morse's Beach Patent dis. Morse's Adjustable each, \$10.00, dis 3 Danbury each, \$6.00, dis 3
Awi Hafts.	Billid Butts, Nichelson dis sector Billid Butts, Huffer of dis sector billid Butts, Sargest's, Nos. 1, 3, 5, dis 50% rote Billid Butts, Sargest's, No. 12. dis 50% rote Billid Butts, Reading's Gravity dis 50% rote Billid Butts, Reading's Gravity dis 50% rote Clark's Improved Shutter Hinge, Nos. 0, 1, 1%, 2, 2%, 7, 18, 19, 19, 19, 19, 19, 19, 19, 19, 19, 19	Resident
Awi Haits. wing, Buss Ferrule\$3.50 \(\) gross—dis 40\(\) to tent Sewing, Short\$1 \(\) \(\) \(\) doz.—dis 40\(\) to tent Sewing, Long	Humason & Beckley Mfg. Co. dis 25 Handley dis 25 Boatty s. dis 248	Standard F gross, \$18.00, dis 2 Family (T. & S. Mig. Co.) F gross, \$18.00, dis 2 F gross, \$18.00, dis 2 F gross, \$12.00, dis 2 F gross, \$10.00, dis 2 F gro
atent Peg, Leather Top \$12.00 \$ gross—dis 40&10 } A wis, Brad Sets, &c. wis, Sewing, Common \$ gross \$1.70—dis 25&10 }	1 2 3 4 5 6 7 8 816.50 10.00 21.50 24.00 27.00 30.00 33.50 36.50 (18 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	Triumph (T. & S. Mfg. Co.)
vis, Shouldered Peg # gross \$2.15—dis 25&10 vis, Patent Peg # gross 53c—dis 25&10 vis, Shouldered Brad # gross \$2.70—dis 25&10	American	Elevator Buckets, Mill E. Buckets, light. 34 to 10 in. (Due's Improved), P 100, 810 00 84.00. dis 1 Mill E. Buckets, heavy, 5 to 10 in. (Duc's Improved), P doz. 84.00 00 810.20. dis 1 Storehouse (Duc's Patents), 12 to 17, \$12 0 870dis 1
vis, Handled Brad	No. 4, French	Storehouse (Duc's Patent), 12 to 17, \$12 @ \$20dis no Emery and Emery Paper. Regular numbers
tent Peg, Leather Top . \$12.00 \$\pi\$ gross-dis switco \$\pi\$ wis. Brad Sets. &Cc. vis. Sewing, Common . \$\pi\$ gross \$1.70-dis 25&to \$vis. Shouldered Peg . \$\pi\$ gross \$2.45-dis 25&to \$vis. Patc nt Peg \$\pi\$ gross 62.45-dis 25&to \$vis. Patc nt Peg \$\pi\$ gross 63c-dis 25&to \$vis. Shouldered Brad . \$\pi\$ gross \$2.00-dis 25&to \$vis. Handled Brad . \$\pi\$ gross 63c \$2.00-dis 25&to \$vis. Handled Scratch . \$\pi\$ gross-dis 125&to \$vis. Socket Scratch . \$\pi\$ gross-dis 125&to \$vis. Socket Scratch . \$\pi\$ gross-dis 105&to \$vis. Socket Scratch . \$\pi\$ gross-dis 105&to \$vis. Socket Scratch . \$\pi\$ gross-dis 25&to \$vis. Socket \$100-dis 25&to \$100-dis	Star	Emery and Emery Faper. Regular numbers. Flour and F. S. & A. Emery Paper. Shley's Emery and Croces Cloth, large size, \$10; modium, \$0.50 \text{ Fram.}
	# 16.00 12.00 21.10 24.90 27.00 20.00 33.50 36.50 (13.00 14.00 24.10 24.90 27.00 28.00 33.50 36.50 (13.00 24.10 24.00 24.00 24.00 38.00 38.50 24.00 24	Enneled and Tinned Ware. Example and Tinned Ware. Example and Tinned Ware. Settles
ngle Bit. 46 to 54 and under. \$\pi\$ dos 8.00 pet gie Bit. 45 to 5 and over. \$\pi\$ dos 83.50 net gie Bit. 5 to 5 and over. \$\pi\$ cos 83.50 net unite Bit. 46 to 54 and under. \$\pi\$ dos 81.00 net unite Bit. 46 to 54 and under. \$\pi\$ dos 81.00 net unite Bit. 46 to 50 and over. \$\pi\$ dos 81.00 net unite Bit. 50 verted. \$\pi\$ cos 4 dos advance	Champion	Inned Sauce Pans. dis a Eacutcheen Pins. dis a
		Recutcheons Door Lock Same discounts as Door Loc Brass Thread dis to Wood dis 12
Axle Grense. aser's	Pistol Water proof, extra heavy, 1-10's\$1. 10 Musket Caps, 1-10's	Wood dis a
andard list	U. M. C., Cen. fire ground	Faucets dis 4
	Double Waterproof, in t-10's \$1.40 \ dis 10.0 \\ 7.0 \ dis 10.0 \\ F. L. 500 \	Frary's Patent Petroleum. dis 20&11 West's Patent Key dis 4 Ancher Lock di
Sells.	E. B. 1-10, trimmed	West's Patent Key dis 4 Ancher Lock di- Metallic Key, Leather Lined dis 6 Cork Lined dis 6 Cork Lined dis 6 J. Sommer's Best Metallic Key dis 5 J. Sommer's Cork Lined set quality dis 5 Self-seasuring, Enterprise 9 dos. 830.00, dis 2021 Self-seasuring, Lane s Quality School dis 2021 Self-seasuring Victor 9 dos. 830.00 dis 2021
ng, Abbe's	Central Fire. dis zodito Central Fire. dis zodito Cards. dorse and Curry.new list, July, 8z, dis re- Cotton new list, July, 8z, dis re-	Self-Measuring, Enterprise. # dos. \$30.00, dis 20210 Self-Measuring, Lanes . # dos. \$6.00, dis 20210 Self-Measuring, Victor . # dos. \$6.00, dis 20210
ank, Taylor's	Wool	Folios Piates
ens. Connect a dis 1562.0 5 ver Sargent's dis 55.2.0 5 ver, Taylor's Bronzed or Plated dis 25.2.0 6 ver, Taylor's Japanned dis 25.2.0 6	Cast Iron, Steel Points	J & Riley Carr Horse Raspa. dis : Butcher's. loss & Gambie. new list, dis re
ver, R. & F. M. Co.'s	Plate	H. Disston & Sons (new list)
ank. Counel's. dis 19k10 ger Sargent's list counel's. dis 19k10 ger Sargent's. dis 19k10 ger Sargent's laphanned. dis 19k10 ger, 1k2 ger Sargent's laphanned. dis 19k10 ger, 1k ger Sargent's laphanned. dis 19k10 ger Sargent's l	Mariin's Patent (Phoenix)	Union File Codis 50
w, Western, Sargent's list	Martin's Fatent (Finonis)	Finting Machines.
w, Dodge's Genuine Kentucky, new list- los. 0 1 116 2 3 4 5 6 Hog \$12.00 10.00 9.00 8.00 7.00 5.00 3.00 2.90 5.00} dis 60 \$	Trace, 04-10-2.	Fagle, 34 inch Roll
settawa. settawa. seksmitsh. Common. dis 45 % coksmitsh. Exura Pittaburgh Fattern. dis 50 % iders'. dis 25 % dis 26 %	German Coli, list of Dec. 31, 1861	Crown Jewel
iders dis 25 3 nd Bellows dis 20 3 lestring, Rubber. ting and Packing Co. dis 50 3	Peck, Stow & W. Co	
ting and Packing Codis so S It Helders. cension, Barber's	* halk. #gross for helk. White. #gross for helk. Red. #gross for nel Slue. #gross fire nel White Crayons. #gross fire nel Chalk Lines.—See Lines	Trown Hand Fluter, No. 1, \$15; 2, \$12.50; 3, \$10.00 \$\times \text{dos}
Ing and Facking Co	White Cravons	
Hind Adjusters.—Domestic? dos \$3.00—dis 30 % relaior	Chisels. Socket Framing, Crossman. Socket Framing, Arlington Edge Tool Codis 6-king Socket Framing, and Hington Edge Tool Codis 6-king Socket Framing, Stocket Framing, Stocket Framing, Stocket Framing, Stocket Framing, Stocket Framing, Stocket Framing, Douglass. Socket Framing, Douglass. Socket Framing, Douglass. Socket Framing, Douglass. Socket Framing, Mitherby Tool Codis 6-king Socket Framing, Mitherby Tool Codis 6-king Socket Framing, Mitherby Tool Codis 6-king Socket Framing, Witherby Tool Codis 6-king Socket Framers, Complians.	Fly Traps. Paragon
Hind, Fameners. \$\times \text{dos pairs. \$\times \text{dos dis } \colon \text{dos } \text{air. } \text{dos pairs. } \text{\$\times \text{gro, dis } \text{car. } \text{dos } \text{gro, dis } \text{car. } \text{dos } \text{gro, dis } \text{car. } \text{dos } \text{gro, dis } \text{dos } \text{gro, los } \text{shburn's Old Pattern.} \text{dos } \text{dos } \text{gro, los } \text{dos } \text{dos } \text{dos } \text{gro, los } \text{dos } \text{dos } \text{gro, per gro, los } \text{dos } \text{dos } \text{gro, per gro, los } \text{dos } \text{dos } \text{per gross. } \text{dos } \text{dos } \text{dos } \text{per gross. } \text{dos } \text{dos } \text{dos } \text{per gross. } \text{dos } \text{dos } \text{dos } \text{per gross. } \text{dos } \text{dos } \text{dos } \text{per gross. } \text{dos } \te	Socket Framing, Witherty Tool Co. dls 65&10 & Socket Framing, Douglass dis 65&10 & Socket Framer, Crossma dis 65&10 & dis 65&10 & Socket Framers, Crossma dis 65&10 & dis 65&10 & Socket Framers, Crossma dis 65&10 & dis 65&10 & Socket Framers, Crossma dis 65&10 & Socket Framers, Cros	Hay, Manure and Spading
ishuru & Oid Fattern	Socket Firmers, Arlington Edge Tool Co dla 65x10 2 Socket Firmers, Buck Bros 1876 llst, dis 2254 8 Socket Firmers, Merrill	Fruit and Jelly Presses. Enterprise Mig. Co
tind Staples. bed, 1/2 in. and larger	Socket Firmers, Douglass' dis 05&10 s Socket Corner dis 65&10 s Tanged Firmers dis 65&10 s	Fry Pans. No
	Tanged Firmers, Butcher's \$\text{94.00}\text{94.00}\text{95.00}\text{118.00}\text	WORLD STREET,
field Block Co., L. R. and L. "trap"d field Block Co., W. I. C. bushed. field Block Co., W. I. ali steet roll"r field Block Co., L. & I Sheares field Block Co., L. & God So. So. field Block Co., L. & God So. field Block Co., L. & God So. So. field Block Co., L. & God So. So. field Block Co., L. & God So. field Block Co., L. & God So. So. field Block Co., L. & God So.	Iron, Providence Tool Co.'s Wrt. Irondis 25 %	G larking Stanley's dis solite Marking Chapin's dis 15212 Wire. dis 15212 Wire. Dission's dis 1021 Wire, Dission's dis 202 Wire, Wheeler, Asaddan & Co dis 202
oits. t Iron Barrel Shutter, &c	iron, Adjustable, Lambert's dis 20 % iron, Adjustable, Sn. w's dis 40 % iron, Adjustable, Hammer's dis 10 % iron, Adjustable, Hammer's dis 10 %	Gimlets. Nail and Spike
s' Pateat Deer Bolts dis 55€10 5 ought marrel dis 55€10 5 aw_ht Square. dis 55€10 5	Clamps. Iron, Providence Tool Co.'s Wrt. Iron. Iron, Adjustable, Gray's. Iron, Adjustable, Lambert's. Iron, Adjustable, Lambert's. Iron, Adjustable, Sn.'w's. Iron, Adjustable, Hammer's. Idis 258 Iron, Adjustable, Hammer's. Iron, Adjustable, Stearns'. Iron, Carriage. Iro	"Diamond "Gimlets dis 408 10 Double Cut, Shepardson's dis 408 10 Double Cut, Hartwell's dis 408 10
ought Shutter, Brass Knob, Stanley's listdis 50&10 S ought Shutter, Brass Knob, Stanley's list.dis 50&10 S ought Shutter, Sargent's listdis 50&10 S ought Sunk Flush. Sargent's	Clips, Axie. Clips, Axie. Norway or 1868. Superior. Lockeyea. Lockeyea. Lockeyea.	Double Cut, Ives' dis socio Double Cut, Douglass' dis 40 "Bee" \$ gro. \$12.00, dis 20
night Sunk Flush, Stanley'sdis 408 to \$ uight B. K. Flush. Com'n Stanley'sdis 408 20/2 > tlage and Tire, Common	Cockey es. dis 5; % Cockey es. dis 5; % Cockey Hruss. Sacking, new list, July 10, 1886 Flain Hibbs, new list, July 10, 1885 dis. 45 % dis. 45 %	Glue Pots. Tinned and Enameled
riage and Tire, Philadelphia, new listdis 70 % riage and Tire, Philadelphia Patterndis 70 % on Carriage	Plain Bibbs, new list. July 10, 1882	
Am. Scr. w Co.'s, Phila	Foard and Box	Reading Hardware Co
re, B. B. & W	Webb's Patent. dis 25 % Combined Dinner Pati and Lamtern. Per doz \$15.00	Gan Wada. U. M. C. B. E., 11 up. U. M. C. B. E., 9810. 2.30 U. M. C. B. E., 788. 2.50 U. M. C. P. E., 11 up. 2.10 U. M. C. P. E., 5810. 2.50 U. M. C. P. E., 5810. 2.50 U. M. C. P. E., 788. 2.60
lion Barrel Shutter, &c. dis 56&10 € tron Chain (Sargent's list) die 56&10 € as the Square sught Shutter, Birson (Stanley's list die 56&10 € aught Shutter, Brass Knob, Stanley's list die 56&10 € aught Shutter, Sargent's list die 56&10 € aught Shutter (Sargent's list) die 56&10 € aught Shutter (Sargent's list	f ompasses, Dividers, &c. dis 50 % Compasses dis 55 % allpers dis 55 %	U. M. C. P. E., 98 to
CT W. M. C.	Dividers. dis 5,5 Dividers. dis 5,5 Berli's & tall Co.'s Dividers. dis 506,5 Berli's & tall Co.'s Compasses and Callipers. dis 506,5 Berli's & Call Co.'s Wing & Inside or outside. dis 5,6 Berlis & Call Co.'s Wing & Inside or outside. dis 5,6 Berlis & Call Co.'s Ouble dis 5,7 Berlis & Call Co.'s (Call's Patent Inside). dis 5,6 Berlis & Call Co.'s (Call's Patent Inside).	Covert's Pat. Rope
ering Machines. Upright 4 quality no Augers	Hersis & Cali Co. '8 wing & Inside or outside. dis 4085 \$ Bernis & Cali Co. '8 Double dis 50 \$ Bernis & Cali Co. '8 (Cali's Patent Inside) dis 20 \$ Fxcelsior dis 20 \$ Cook's Extension dis 25 \$	Manydole's dis 15 dis 15 dis 15 dis 15 dis 15 dis 15 dis 16 dis 20 dis 2
oxes. rchangeable Shelf Boxesdis 20 %	Bradley's dis to @ 20 5	Magnetle Tack Non t 2 2 81 26 1 40 and 1.75 dis 25& 10
. Backus	Sarton's. d seekly Mfg.Co.dis 23/5 & Coris kerewa.—Humason & Beckly Mfg.Co.dis 23/5 & Clough's Pat. dis 23/5 & Gro & Hvers and Cutters.—Bradicy's dis 25/5 & dis 25/8 adsworths.	Neison Tool Works dis 4c&to: Warner & Noble's dis ty Verkee & Plumb dis ty Wilkinson's Smiths' lige \$ 3 ne
Tard's Fatent dis toke \$ Fat at the content of the	Wadsworths. dis 25 % (row Bare) ast Steel P 5 %c	Hand Cuffs and Leg Irons. Providence Tool Co., Hand Cuffs, \$1,00 P dos.dis to providence Tool Co., Leg Irons, \$25,00 P dosdfs to Iowersds.ds.ds.ds.ds.ds.ds.ds.ds.ds.ds.ds.d
Facekus	Crow Biars	Handles, -Door or Thumb Latches.
	Pinching Irons. doz \$7.50, dis to \$ e urry Combs. Fitch's.	Nos
f. plain	Fitch's, Novelty, new list, Ju y 126. dis 5-205 Hotchkiss, Novelty, new list, Ju y 126. dis 25 5 Hetchkiss, Exclr. supr. Champi. n. dis 25 5 kubber. gds 262 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Jap'd Store Door Handles—Nuts, \$1.52; Plate. \$1.10; no Plate, \$0.85. dis 10 flare flare floor. # Gos \$1.50. dis 10 flare floor.
right Wire Goods 1st of Dec. 15, '79dis 55210 5	silvered Glassnet	wrought creat dis 70 9 Surface Chest dis 60 to 5 Flush Chest dis 60 to 5
uli Rings.	Cutlery.	Lifting
mii Rings	Cutiery Co. (Table)	Per dos. 20.5 1.00 1.15 1.35 1.40 dis bockto Rosgifits Lationes

EM TOLK MII	
Hutts, Wrought Brass,	男女女女女女女女女女女女女女女
Fast Joint, Narrow	THERESENE SAN
LCOGE PIN, ACOTRS, Japanned. Plaved Tips. dls 60&to: LCOGE PIN, ACOTRS, Japanned. Plaved Tips. dls 60&to: Fast Joint, Narrow. dls 50&to: Fast Joint, Lt. Narrow. dls 50&to: Fast Joint, Broad. dls 50&to: Fast Joint, Broad. dls 50&to: LCOGE PIN, Broad. dls 50&to: LCOGE PIN, Wrt. dls 50&to: LOGE PIN, Wrt. dls 50&to: LOGE PIN, Wrt. dls 50&to: LOGE PIN, Light. dls 50&to	
Bilind Butta, Shepard's "Double Locking." Nos. 1 & 2. dis 70 s Shepard's Standard, Nos. 4 and 5. dis 70 s Shepard's Standard, Nos. 4 and 5. dis 70 s Bilind Butts, Luil & Porter dis 70 % to 8 Bilind Butts, Nichelson dis 4 % to 8 Bilind Butts, Huffer dis 60 s Bilind Butts, Huffer dis 60 s Bilind Butts, Ciark's, Nos. 1, 3, 5 dis 70 % to 8 Bilind Butts, Sargent's, Nos. 1, 3, 5 dis 50 % to 8 Bilind Butts, Sargent's, Nos. 1, 2, dis 50 % to 8 Bilind Butts, Reading's Gravity dis 60 % & 1 % 5, 2 20 % " dis 60 % to 8 10 % " dis 60 % to 9 10 % "	
Sarycent & Co.'s	
Puplex	A STATE OF THE PERSON NAMED IN COLUMN 1
Hicks & Goldmark's F. L. Waterproof, 1-10's	the state of the s
Pistol Waterproof, extra heavy, 1-10's\$1, 10 s. Pistol Waterproof, extra heavy, 1-10's\$2. \$1, 10 s. P. C. Trimmed\$2. \$2. \$2. \$2. \$2. \$2. \$2. \$2. \$2. \$	And the second contract of the second contrac
Wool new list, July, '8, ulr 10 % (arpst ™treschers. Cast Steel, Polished ₩ 902 8.c.0. dis 95 € Cast Iron, Steel Points ₩ 602 8.c.0. dis 95 € Socket ₩ 602 8.2.0. dis 35 € Socket ₩ 603 8.2.0. dis 35 € Socket ₩ 603 8.2.0. dis 35 € Casters.—Bed dis 35 € Casters.—Bed dis 35 € Casters.—Bed dis 35.25 € Shallow Socket dis 35.25 € Socket dis 35.25 € G Socket	
Chain. Trace, 04-10-2	
White Cravons #gross it one that the Cravons of the Chalk Lines—See Lines #gross it one that the Chalk Lines—See Lines #gross it one Chale Socket Framing, Crossman. Socket Framing, cuck fros. #850 list, dis 22% \$ Socket Framing, buck fros. #850 list, dis 22% \$ Socket Framing, wither by Tool Co. dis 65& to \$ Socket Framing, Witherby Tool Co. dis 65& to \$ Socket Framing, Douglass dis 65& to \$ Socket Firmers, Crossman. dis 65& to \$ Socket Firmers, Buck Bros. #850 list, dis 22% \$ Socket Firmers, Buck Bros. #850 list, dis 22% \$ Socket Firmers, Buck Bros. #850 list, dis 22% \$ Socket Firmers, Witherby Tool Co. dis 65& to \$ Socket Firmers, Witherby Tool Co. dis 65& to \$ Socket Firmers, Witherby Tool Co. dis 65& to \$ Socket Firmers, Witherby Tool Co. dis 65& to \$ Socket Firmers, Witherby Tool Co. dis 65& to \$ Socket Firmers,	
Socket Firmers, Douglass' dis votre Socket Corner dis Socket Corner dispose dissocket Corner dispose dissocket Corner dispose dissocket Corner dispose d	Harten Carlotte
Iron, Adjustable, Hammer's	Talbut Calebrates - as
Manush dia 43 Manush dia 43 Manush dia 43 Manush dia 43 Manush dia 45 Manush dia 46 Ma	SE TUTTUE C
is m s & Call Co 's Compasses and Callipers, dis socs § Pent's & Call Co 's Wing & Inside or outside, dis socs § Semis & Call Co. 's Double dis 5 § Semis & Call Co. 's Call's Patent Inside). dis 5 § Semis & Call Co. 's Call's Patent Inside). dis 5 § "xc'slor". dis 5 § "xc'slor". dis 5 § "xc'slor". dis 2 §	OH LOHHVINAMAN
Additional Cutters	PAL
Tich N. dis 5-20 5 totchkiss, Novelty, new list, Ju y 120. dis 5-20 5 totchkiss, Exclr. Supr. Champi n. dis 25 5 tetchkiss, Exclr. Supr. Champi n. dis 25 5 tubber. do 62 5 6 4 artain Pins. do 62 5 6 4 artain Pins. dis 25 6 4 artain Pins. dis 25 6 tubers. dis 25 6 6 artain Pins. dis 25 6 tubers.	RBJ BWSFL

l	DIESAIE FIICES)
W.W.	Dec Collars. Embossed Gilt	0 0
S S S S S S S S S S S S S S S S S S S	Lamenta Dad manulan sine 20 des de die se	
2888	Gray's Rod dis r Gray's Rod dis r Bee Rod dis r Warner's dis g	200
RAWAR	No. 1, Large Japanned	E
7 %	No. 4 ("Shoo Fly") Screen door size, \$\vec{x}\$ dos \$1.50 No. 5, Screen Door size. \$\vec{x}\$ dos 2.00 No. 6, Medium. \$\vec{x}\$ dos 2.75 No. 7, Large \$\vec{x}\$ dos 4.00	9
***	dabin's LeverNo. 1, \$1; 2, \$1.50; 3, \$2; 4, \$2.50. dis 35; abin's Boss.No. 1, \$\vec{4}\$ dos. \$4.00; 2 \$2.75; 3, \$2.dis 33/5; abin's 'rown	M. M. M. M.
***	Cowell'sNo. 1, W dos. \$18.00; No. 2, \$15.00, dis so Rubber, complete	CAL MAN
**	Drawing K vives. Arlington Edge Tool Co	MAN
A M M M M	Nobles Mfg. Co	MMMM
RMMMI	Douglass	XX
RHHHI	Drills and Drill Stocks. Slacksmiths' Self-Feeding. each, \$2.50, dis ro Slacksmiths' Self-Feeding. each, \$7.50, dis zo Blacksmiths' Self-Feeding. each, \$7.50, dis zo Breast, P. S. & W. dis zoëtro Breast, Wilson's. dis zo Breast, Wilson's. each, \$2.00, dis zo Breast, Bartholome. W's each, \$2.00, dis zo Breast, Bartholome. W's each, \$2.00, dis zo Breast, Bartholome. W's each, \$2.00, dis zo Batchet, Morrill's. dis zo Batchet, Weston's. dis zo Batchet, Moore's Triple Action. dis zo Batchet, Moore's Triple Action. dis zo Batchet, Moore's Triple Action. dis zo Batchet, Moore's Triple Action. dis zo Batchet, Moore's Triple Action. dis zo Batchet, Born's Hand Drill, Plain, \$1.00 Adjustable, \$2.20. dis Wilson's Drill Stocks. dis zo Drill Chucks. each, \$2.25, dis zo Drill Chucks.	MMMM
W W	Breast, Wilson's	MXXX
MARK	Ratchet, Ingersoll's dis 25 Ratchet, Whitney's dis 20 Ratchet, Weston's dis 20 Ratchet, Weston's Triple Action dis 20	RXXX
WWWW	Whitney's Hand Drill, Plain, \$1.00 Adjustable, \$12.00. dis Wilson's Drill Stocks. dis 10 Automatic Boring Tools each \$2.2 dis 20	MMM
2	Drill Chucks. Morse's Eeach Patent. Morse's Adjustable. each, \$10.00, dis 30 Danbury. each, \$6.00, dis 30	N K K
MMMM	Egg Beaters. # dos. \$2.50, dis 25	N. N.
W. W.	Top Beaters. \$\Pi\$ dos. \$3.50, dis 2	1000
2	Acme. Pgress, \$12.00, dis 25; Triumph (T. & S. Mfg. Co.) Pgress, \$11.50, ne Elevator Buckets, Will E Ruckets, dight, sk to se in Duc's Improvedit	
* * * * * * * * * * * * * * * * * * * *	Elevator Buckets, Mill E. Buckets, fight, 2½ to 10 in. (Due's Improved), # 100, \$17.00 & \$4.00	
N N N N	Emery and Emery Paper.	
K K	Flour and F. F. 8. & A. Emery Paper	
200	Enameled and Tinned Ware. dis 50 5 sauce Pars. dis 25 5 linned Sauce Pars.	6 (
	Escutcheon Pins. Brass	1
-	Door Lock	
	Faucets. dis 40 % Bohren's Patent Rubber Ball. dis 25 % Fenn's Cork Stops dis 334 %	
	Star	
	Metallic Key, Leather Lined	
	Pattoers. Fenn's	
	Files. J. & Riley Carr	
	J & Riley Carr Horse Rasps dld 108 Butcher's dle 108 Hoss or & Gamble dle 148 L Diaston & Sons (new Hst) dle 48 He ler Bros. Horse Rasps dle 58 Heller Bros. Flies dle 58 Nicholson dle 50 New Amarican dle 50 Union File Co dle 50 Stube mew Hst. dis 3260	-
	Heller Bros.' Files dis 50 % Nicholson die 50 % New American dis 50 % Union File Co.	
	Finting Machines. Knox. 46-inch Rolls. By the seach and the seach are seach as a seach and the seach are seach as a seach and the seach are seach as a seach are seach are seach as a seach are seach are seach as a seach are seach as a seach are seach are seach are seach as a seach are seach as a seach are seach are seach are seach as a seach are seach as a seach are seach are seach are seach are seach as a seach are seach as a seach are sea	Constitute and an over-
	Fiuting Machines. Knox, 494-inch Rolls. Knox, 5-inch Rolls. \$4.00 each } \$5.50 each } \$6.15, 45 inch Rolls. \$4.00 each } \$6.15, 45 inch Roll. \$6.1	-
	Crown Jewel	-
	Crown Hand Fluter, Nos. 1, \$15; 2, \$12.50; 3. \$10.00 P doz. Shepa"d Hand Fluter, No. 85per doz \$15, dia 40 \$	
	Crown mand rutter, No. 8, 1, \$15, 2, \$12.50; 3, \$10.50 \$\psi\$ dos. \$\psi\$ dos. \$15 \psi\$ dos. \$5, \psi\$ per dos \$1.75, dis 50 \$ \$\$ shepard Hand Fluter, No. 10 per dos \$1.75, dis 50 \$ \$\$ shepard Hand Fluter, No. 5; per dos \$6.50, dis 50 \$ \$\$ lotaris * Band Fluter. \$\$ dos \$1.50, dis 10.5 \$ \$\$ dos \$1.50, dis 10.5 \$ \$\$ buffalo. \$\$ \$\$ \$\$ dos \$1.50, dis 10.5 \$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$\$ \$	-
1	Fluting Sciesorsdis 45%	-
	Paragon dos, \$3, net	-
	Hay, Manure and Spading	-
1	Fruit and Jelly Presses. Enterprise Mfg. Co	-
	# dos\$3.00 3.79 4.25 4.79 5.25 6.00 7.00 10.00 9.00 "Acme"	
	Anges, dis soltes distribute dist	-
7	Wire, Wheeler, Madden & Co	-
1	Wire, wheeler, andden at CO disable Cilimeters. Sail and Spike. dis 40kto \$ Eureka "Gimlets. dis 40kto \$ Diamond "Gimlets. dis 40kto \$ Double Cut, Shepardaon's. dis 40kto \$ Oouble Cut, Shepardaon's. dis 40kto \$ Oouble Cut, Hartwell's. dis 40kto \$ Oouble Cut, Hartwell's. dis 40kto \$ Oouble Cut, Douglass' dis 40kto \$ Oouble Cut, Douglass' dis 40kto \$ Double Cut, Double Cut, Douglass' dis 40kto \$ Double Cut, Double Cut, Double Cut, Bartwell's dis 40kto \$ Double Cut, Bartwell's dis 40kto	
- 54	Double Cut, Ives'	
- Supplied	Gine Pots. 'inned ane Enameled	40.4
	Grindetone Fixtures. argents Patent	(1
	Gan Wads.	The same
The Paris	. M. C. B. E., 14 up	metal he
E	overt's Pat. Ropedis so	1
E		and hed hed
		HHMMM
AND	erree dis 5 laguette Tack. Nos. 1, 2, 3, \$1.26, 1.50 and 1.74 dis 24&10.5 eison Tool Works dis 4&10.5 farner & Noble's dis 5 farner & Noble's dis 5 file 1,	20 mm mm
Part H	Hand Cuffs and Leg Irons. rovidence Tool Co., Hand Cuffs, \$15.00 F dos.dis 10 % rovidence Tool Co., Leg Irons, \$25.00 F dosdis 10 % ower sdis 25 %	MAN
	Handles Door or Thumb Latches.	I

		_
**** **	Hickory Firmer Chisel, assorted, # gross \$4,50 Hickory Firmer Chisel, large, # gross	8 10
%%%	Auger, assorted. # gross. 2.73 Auger, assorted. # gross. 5.00 Auger, large. # gross. 7.00 Patent Auger, Ives". dis 25 l'atent Auger, Douglass' # set \$1.25 D Fatent Auger, Swan's. # set \$1.00 D tiangers.	s et
	Barn Door, New England. dis 6-& coard Barn Door, New England. dis 6-& collinax (Anti-Friction). dis 50-& collinax (Anti-Friction). dis 50-& collinax (Anti-Friction). dis 50-& collinax (Anti-Friction). dis 50-& collinax (Anti-Friction). dis 6-& collinax (Anti-Friction). dis 6-& collinax (Anti-Friction).	RWWWW
	Kidder's	MMMI
	Herry's Patent. (In, \$12; 135 III., \$10; 018 40 Herrsess Numps. (In, \$12; 135 III., \$10; 018 40 Herrshaw's, list of 15 changed to \$14.00. (dis 60 Judd's, list of 15 changed to \$14.00. (dis \$1.00 Judd's, list of 15 changed to \$1.00. (dis \$1.00 Judd's, list of 15 changed to \$1.00. (dis \$1.00 Judd's, list of 15 change to \$1.00. (dis \$1.00 Judd's) dis \$1.00 Judd's State of 15 change to \$1.00 Judd's Sta	MANAMA
	Sargent's dis octors dis octors derman, low list, Sep. 1882. dis 33/5 German, Sargent's new list. dis octor Covert dis octored Spring, new list, Oct., 1882. dis octor Hatchets.	WWWW W
	Covered Spring, new list, Oct., 1882	5 1
Therefore and the party and	Lathing, Nos. 123.	1
-	Shingling, Nos. 1 2 3	6
District Control of the last o	Hroad, Nos. 1 2 3 4 W GOE 9.00 10.00 12.00 14.00	P
	Broad Nos. 56 7 8, \$\phi\$ dos 16.00 18.00 20.00 22.00 Collins dis 10 Shingling Nos. 12 3 \$\phi\$ dos 50.0 \$\phi\$ dos 6.00 6.00 0.00 Lathirg, Nos. 12 3 \$\phi\$ dos 50.0 \$\phi\$ dos 6.00 \$\phi\$ dos 6.00 \$\phi\$ dos 6.00 \$\phi\$ dos 50.00 \$\phi\$ dos 50	P
The second second	Ax Pattern, Not. 12 5. 4 dos 80.00 dis 12 6. 1 12 60 1	D
	"Lightning"	KKK
	Rolled Blind Hinges	B
1	Heavy Welded Hook \$5 to 12 in \$7.00 \$7 100 \$5 \ dis \$1.0 \$1.0 \$1.0 \$7.00 \$1.00 \$5 \ dis \$1.0 \$1.0 \$1.0 \$1.0 \$1.0 \$1.0 \$1.0 \$1.0	(50
1000	Wrought Strap and T dis 542rds Hees. # dox \$1.00. dis 542rds Riveted Shank # dox \$1.00. dis 5.5 Socket # dox \$2.5, dis 5.5 Grub. # dox \$1 dis 3.5	Si Ci Bi
- The	Handled Planters"	I SE
1100	Bird Cage, Rargent's list	THE
-	Cotton (Humason & Beckley Mfg. Co). dis so & belt. dis ook to belt. dis ook to bench—Hotoekiss \$5,00 % dos. dis so & weston's. No. 1, \$1,00 % dos. dis so \$1 % Weston's. No. 1, \$1,00 % dos. dis so \$1 % fedil's, \$5,00 % dos. dis so \$1 % fedil's, \$5,00 % dos. dis so \$1 to the Line, Sargent's list. dis so \$2,00 % dos. dis so \$1 to \$1 % fedil's, \$1 % fedi	UN BMP
A A A A B IN	Harness, Canding list. dis coccessor of the coccessor of	A O O BB
Trere	Acture Hooks, Brown's Par. Bolid Brass, \$4.00 more gross. Glassel and Picture (T. & S. Mfg. Co.)	Figure
A HIM	Whimstree—Faint	Ri AG Bri
CHMP GA	100ks and Kyes—Srhas	Bi Po Po Po
NE	Evriged "310 280 260 240 240 290 dis 30 % iew Haven, " 310 280 260 240 240 290dis 30&10 % ringewater," 240 210 190 180 170 150dis 25 %	MLi As Cz
P PART	Half-See Salves Co., Perkins' Improved. Light, Medium and Heavy. Light, Medium and Heavy. Valier's Forged, Light, Med. or Heavy. Valier's Forged. Light, Medium and Heavy. Valier's Forged. Light, Med. or Heavy. Veg \$5.37% Veg \$5.37% Light, Med. or Heavy. Veg \$5.37% Light, Med. or Heavy. Veg \$5.37% Veg \$5.37% Light, Med. or Heavy. Veg \$5.37% Veg \$5.37% Light, Med. or Heavy. Veg \$5.37% Veg	Ma Ba Th Ba De La Pl
MADDAU	Valker's Forged, Light, Med. or Heavy Pkeg 84.57% une shoes. Pkeg 85.57% une shoes. Pkeg 85.57% une shoes. Pkeg 85.57% une shoes. Pkeg 85.57% une shoes a shoe	PL PL
A	mu. Mch. Cedia 40 %	Bu Ha Hu
SIA	ice Crespers. afety keversible	Ru P. P. Dis
B	Kettles. Brass, 7 to 13 inches inclusive	Ch Ch Sta
AMHE	mes' Shoc Knives dia 20 % mes' Shoc Knives dia 1.5 mes' Shoc Knives dia 1.5 mes' Bread Knives dia 1.5 mes' Bread Knives dia 1.5 ay and Straw, Wadsworth's dis 33½ able and Pocket Sec Cutlery fix nobs. meriage (Jan'd Soc W gross), dis botho 5	Va
Billion	ase—Common. dis sok to \$ emacite Door Knobs. new list, dis 35&5 \$ oor Mineral. oor Por Jap'd. oor Por Plated. Same discounts as Door Locks. oor Por.	Eu: Lee
行行門は出	able and Pocket. See Cuttery K nobe. Briage (Jap'd Soc # gross). dis both 5 sar-Lorente Door Knobe. dis 30&10 5 semacite Door Knobe. new list, dis 35&5 5 oor Por. Jap'd. oor Por. Jated. Dor Por. Jated. Same discounts as Door Locks. Dor Por. Jated. dis 20 5 curre, tudd's. dis 66 tr.21 5 curre, Sargent's. dis 60 tr.21 5 curre, Sargent's. dis 60 tr.21 5 curre, Porcelain. dis 30 5 at 41es.	Dis E. I Pri Wa Du
in the	A meiting, Sargout 8	Jap Jap Jap
いははないない	urricale, No. 2	Ha Ha Bha Bel Bel Bel Bel
2000	onver Reflector Red., \$7.50; Large, \$10.00, Bet	Spr Spr Ben Sou R
949	ansylvaniadia 30 % Ulade lphiadia 30 %	euld Euld

	Y M
đis	Porcelain Lined
300E1	Eureka, Tinned
15&1	Jownsend's Patent
s ne	Dean's Nos. 1. % dos. \$15.00; 2. \$9.00; 3. \$5.00.dis 10&10 \$ 1. lines.—Linen Fish
tio:	Lemon Squeezers. Porcelair Lined
50	4% \$2.50. net Masons' Colored Cotton dis 4.5
1 50 865	Locks and Latches. Cabinet, Eagle) Changes made in list price of
100	Cabinet, Bridgeport some numbers Jan. 1, 1881. Cabinet, Bridgeport dis 25&2 % Cabinet, P. & F. Corbin dis 25&2 %
60 9 60 9	Cabinet, A. E. Deits
E OIS	Langstroth & Crane's List, Jan. 1, '77: Round Key, Nos. 1 to 4
10 %	Flat Key. dls 33/5&to \$ A. E. Deitz, Flat Key. dls 30@40 \$ Yale Loca Co. Flat Key dls 40 \$ 168 50 \$
10 %	"Shepardson" or "U. S."
30 %	F. Many's "Extension Cylinder"\$10.50 % doz net
75 25 50	Norwalk List prices as revised March
25 % 75 25	Hussell & Erwin. Dec. 13, dis 45&10 & and 2 % for eash.
30 %	Branford Norwalk Mallory, Wheeler & Co. Whipple Mfg. Co. Trenton Lock Co. Reading Hardware Co. (dow list) Mallory, Wheeler & Co. Whipple Mfg. Co. Reading Hardware Co. (dow list) Mallory, Wheeler & Co. Morwich Lock Mfg. Co. Morwich Lock Mfg. Co. Morwich Lock Mfg. Co. Mis 25 for cash Norwich Lock Mfg. Co. Mis 26 for cash Mis 26 for cash Norwich Lock Mfg. Co. Mis 26 for cash Mis 27 for cash
00 00 30 %	Mallory, Wheeler & Co dis 30%10 % Norwich Lock Mfg. Co and 2 % for cash
50 25	Fale Lock Mfg. Co.'s "Standard"dis 40 % komer's
50 30 %	conestogs dis 60 % candinavion (Moore Bros.)dis 80 % J. H. McWilliamsdis 10 %
00	A. E. Dietz
50	Scandinavian (Moore Bros.) dis 80 %
00 60 30	Ment Cutters. Dixon's(P.S.&W.)Nos, 1 2 3 4
00	Miles' Challenge
00	Esch\$2,00 4.00 5.60 11.00 13.00 30.00—dis 25&5 \$ Woodruffs (P. S. & W.)Nos. 100 150
10 %	Hales'
5 % 5 %	Draw Cut. Nos. 5 2 6 8 10 Each . \$50.00 75.00 80 00 225.00 400.00—dis 20 % American
90%	Nos 1 2 3 4 B 5 Each
0%	Kieser's Gem
0%	Silver & Deming dis 25 Pennsylvania dis 400 to 5
0 %	# doz
0%	Am. (cd quality), w gross, 1 blade, \$7 2 blades, \$12 3 blades, \$18
%	Smith's, \$\ dox, Single, \$2.25; Double, \$1dis 33/56/10 \$ Cowles Edw. Codis 55 \$
% of s	Stebbins Conuine
58	Stebbles Tinned Ends
5 %	Lincoln's Patterndis 60&20 % Weeu's
200	Silver & Denning
2 2	s add ac to list; r b. boxes, add ic to list.) Square Auts. 8 c off list
o %	Boss Nos. 2 \$7,00 8.00 9.00 10.00. \$\times \text{dos. dis 60arc&re \$\frac{8}{2}\$}\$ Natis and Washers(In lots loss than 100 \$\times \text{add \text{ \text{dos. than 100}}\$}\$ \$\times \text{dos. \text{dos. 3}}\$ \$\text{dos. than 100}\$ \$\times \text{dos. 3}\$ \$\times \text{dos. 100}\$ \$\times dos.
0%	Blake's Pattern. F dos \$2.00, dis 4 \$ Turner & Seymour Mfg. Codis 40 \$
200	U. S. Navy.
55	UilersZinc and Tin dis 60 8 Brass and Copper dis 6 8
200	maleable (Hammer's)
3	Oimstead's, Tin and Zinedis 60 \$ Oimstead's, Brass and Copperdis 50 \$ Broughton's, Zinedis 60 \$
18	Broughton's, Brassdis 40 \$ Dacking. Steam. N. Y. Belting and Packing Codis 20 \$
3	Pencis. Pencis. Ingh list, dis 90 % Faber's Round Gilt. Percos % 4.24, net
3%	Dixon's Lead
8	Riches Ralinac, cto 6, \$11.00 i 5to 7, \$12.00
*	Picture Natiss Brass Head, Sargent's list
N. W.	Porcelain Head, Servent's list list lis cotto \$
X X	Pinking Irons
*	Astor Flaiting Machine
×	Crown Plating machinesdis 25 % 6 in., 86.00; 10 in., \$8.00 each. Planes and Plane irons.
36	Bench, First Quality
SE SE SE	Halley's (Stabley R. & L. Co.) new list, Jan. 79. dis 20210 \$ The Stanley (S. R. & L. Co.) new list, Jan. 79. dis 20210 \$ Bailey's "Victor"
et	Defiance Adjustable dis 20&10 % Lafin Mfg. Lo dis 5, % Plane Irons, Butcher's \$5.00 @ \$5.25 to \$
MMM	Plane Irons, Buck Bros
MMM	Iron". dis 20 % Piane Iron, Ohio Tool Ce. dis 20 % Plane Irons, Sendusky Tool Ce. dis 20 %
MM	Pilers and Pippers. Button's Pat 46
K	\$ in. \$ 5.50; No. 4.7 in. \$21.00 \(\text{dos} \) dis 25 \(\text{Hum} \) at the Beckley Mig. Co
8	sureka Pilers and Nippers
8	P. S. & W. Tianers' Cutting Nippersadd 6 %, dis to % Plumbe and Levels.
N.W.	Stanley R. & L. Co.'s Pat. Adjustable
et	Chapin's Patent Adjustabledis 65&10&10 \$ Chapin's Non-Adjustabledis 65&10&10 \$ Standard Rule Co.'s New Adjustabledis 66&10 \$
MMM	Planes and Plane Irons. Bench, First Quality. Bench, Second Glasser, Gl
de sa	Davis' Inclinometers
N W	Fletcher Post Hole Augers # doz #37.50, dia 20 % Vaughan's Post Hole—
MMM	Eureka Diggers # doz \$27.00
	rraning moons and Shears. Disson's Combined Pruning Hook and Saw, # doz \$19.00, dis 20 \$
MMMM	Eureka Diggers # doz \$27,00
N W W	Wheeler, M. & Co.'s Combination ¥ doz \$12, dis 20 \$ Dunlap's Saw and Chisel ¥ doz \$2,00, dis 40 \$ Pulleys.
g :	Hot House and Tackledis 65&10 %
8	Brass Screw dis 70 to 8 lap'd Side dis 50 to 8 lap'd Clothes Line dis 60 to 8 lap's Fork Solid Eye lap Fork Solid Eye lap Fork Solid Eye lap Fork Solid Eye
t]	lap'd Side. die 6.5km fi lap'd Clothee Line. die 6.5km fi die 6.5km f lap'd Fork, Solid Eye. \$2.5c; bwivel, \$c.c., die 5.5km f Hay Fork. "Anti Friction. \$5.7c, die 1.5km f Hay Fork. "F" Common and Pat. Buahed. die 20 f Hay Fork, Tarbox Pat. Iron. die 20 f Hay Fork, "Grabox Pat. Iron. die 45 f die 45 f
1000	shade Rack
	snace sack
564	pring, Leach's Patent. dis 15 semis & Cail Co.'s Spring and Check dis 45 semid Theory.
5	Dail. Sliding Door, Wrought Brass P B 45c, dis 96
1 1 6	L Silding Door, Wrought Brass W h 43c, dis so huiding Door, Broased Wrt. Iron W foot 12c. dis 56 hiding Door Iron, Fainted \$ foot 4c, dis 10810 \$

May 10, 1883.	
Barn DoorInch	Shovels and Tongs.
Barn DoorInch	Shovels and Tengs. fron and Brass Head, R. & E. list fron and Brass Head, P. S. & W collabed Steel, new list
Terry's Wrought Iron, soe \$ foot	Slates. Square Frames, by case
Genuine Emerson dis 45 Badger's Emerson dis 33/4 Badger's Emerson dis 33/4	Defiance Metallic
J. R. Torrey Razor Co. dis 14 Genuine Emerson. dis 4 Badger's Emerson. dis 5 Badger's (not Emerson). \$\phi\$ dos \$\phi_0\$, dis 20 Imitation Emerson. \$\phi\$ dos \$\phi_0\$, dis 20 Hunt's dis 16 Chapman. dis 16 Torrey's dis 20 Rivers. dis 20 Rivers.	Wood Sailey's (Stanley R. & L. Co.), new I Stearns' Speke Trimmers,
Raunder's. dis ac Torrey's. dis ac Rivets, larged new list. Dec. 10, 1881	Bonney's 9 0 \$ Stearns' 9 0 Ives' No. 1, \$15.00; No. 2, \$12.0
Rivers. Iron and Tinned, new list, Dec. 10, 1881	Spoons. Basting. Riveted Table and Tea. Solid Table and Tea.
	Solid Table and Tea
Bair, Brass. dis Stair, Black Walnut	Britannia. Reed & Barton. Holmes. Booth & Haydens. German Silver. Cast Steel, Silver Plated. Tin (P. S. & W.). Teas. Tin (P. S. & W.). Tables. Tin (Cowles Hdw. Co.). Tin (Cowles Hdw. Co.).
Acme (Anti-Friction)	Tin (P. S. & W.), Tables. Tin (Cowles Hdw. Co.). Tin (Cowles Hdw Co.), case lots
Acme (Anni-Friction) Repe. Min's' List, April 20, 1888. Manila. Manila.	Stocks and Dies
Manila, Tar'd Lope. Manila, Tar'd Lath Yarn. # B 10 Manila, Hay Rope. % inch and larger # B 154	c Hindostan No. 1, 6c; Axe, 8c
Sissi Mand 5-10 inch # D 12 Sissi Mand 5-10 inch # D 12 Sissi Hay Rope B D 12	Washita Stone. Washita Stone. Washita Stone. Washita Stone. Washita Stone. Washita Stone. Washita Stone No. 1, 400 fin. Arkanasa Stone No. 1, 400 fin. Turkey Oil Stone (Chase). Lake Superior (Chase). Lake Superior (Chase). Lake Superior (Chase). Grindstones. Family, Loring's.
Chapin's dia 70&10 \$ dis 55&10	g Turkey Oil Stone (Chase)4 to 8 in Turkey Silps (Chase)4 to 8 in
Statilens	Lake Superior, Slips (Chase) Grindstones, Family, Loring's
Sad Irons. Dirom ato 10. Self-Heating. Fidoaso.on in dos. Self-Heating. Fidoaso.on in dos. Glesson's Shield and Tollet. Mrs. Pott's Irons. Doubled Pointed. Mrs. Pott's Irons. Square Back. Enterprise Star Irons, new list, July 20, 1882. dis 35 Combined Fluter and Sad Iron. Chinese Laudry (N. E. Butt Co.). Self. dis 15 New England. Sond Paper.	Joseph Dixon's. Gem. 9 Gold Medal. 9 "Mirror" 8 Ruby Rising Sun
Mrs. Fott's Irons. Square Back. dis 35 Enterprise Star Irons, new list, July 20, 1882. dis 35 Combined Fiuter and Sad Iron. P doz \$15,00, dis 15	"Mirror"
Chinese Laurdry (N. E. Butt Co.)	g Kising Sun Dixon's Plumbage. Soynton's Noon Day & g oss No. 1, small, \$3 :No. 3, medium, \$4.
New England: Sand Faper: Bacder Adamson's Flint, or to 114. \$4.75 \$\pi\$ ream Bacder Adamson's Flint, 2, 24.6 \$3. \$4.75 \$\pi\$ ream Bacder & Adamson's Flint, Assorted. 47.7 \$\pi\$ ream Bacder & Adamson's Flint, Assorted. 47.7 \$\pi\$ ream Bacder & Adamson's Star. 3.7 \$\pi\$ ream Bacder & Adamson's Star. \$4.76 \$\pi\$ ream \$6.06 \$1.00 Bartles Flint. \$4.76 \$\pi\$ san dis 35. Bartles Harrison, \$4.75 \$\pi\$ ream dis 35. Bartles Harrison, \$4.75 \$\pi\$ ream. dis 35. Sew England. same list as B. & A. Flint. dis 35. Bash Cord. Common. \$\pi\$ b 13c no.	Steel. dis 50 %; full cases from dis 50 %; f
Baeder & Adamson's Emery. \$\Pi\$ ream \$6.50 @ 11.50 \] Bartles Flint	Try Square and T Bevels Disston's Try Square and T Bevels. Winterbottom's Try and Mitre
New England, same list as B. & A. Fills	Tacks, Brads, &c. New List, Sept. 1, 1882. Tinned Swedes Tacks
Eash Cerd.	Tacks, Brads, &c. New List, Sept. 1, 1882. Tinned Swedes Tacks. Tinned American Tacks. Swedes Tacks, all kinds. American Cut Tacks. Copper Tacks and Nails. Swedes Hungarian Nails. Gimp and Lace Tacks. Gimp and Lace Tacks. Trunk and Clout Nails. Trunk and Clout Nails. Common and Patent Brads. Brush Tacks. Brush Tacks. Brush Tacks.
River Lake, Prab Cotton w 5 545, dis access Raw Hide, \$\pi\$ foot, \$4 in., 52.; 5.16 in., 70.; \$6 in., 10.; dis 15. Steel Ribbon dis 15.	Swedes Hungarian Nails
Cark's No. 1, \$10.00; No. 2, \$5.00 per grossdis 3335	Finishing Nails. Trunk and Clout Nails
Ferguson's. dis 33.5. Walker's. dis window Springs. dis 25. Hammond's Window Springs. No. 1, \$10.00 \(\pi\) gross. dis 25. The Perfect, Clark & Smith, Plain Jap. \(\pi\) gros, \$10.00 ne The Perfect, Clark & Smith, Por. K'b Jap. \(\pi\) gro. \$4.00 ne The Perfect, Clark & Smith, Por. \(\pi\) Jap. \(\pi\) gro. \$4.00 ne The Perfect, Clark & Smith, Por. \(\pi\) Jap. \(\pi\) gro. \$4.70 ne of Universal. "Universal". dis 30. "Bash Weights.	t Basket Nalls. Brush Tacks Leathered Carpet Tacks. Cigar Box Nalls. Chair Nalls. Double-pointed Tacks.
The Perfect, Clark & Smith, Por. K'b Jap. \$ gro. \$14 net The Perfect, Clark & Smith, N-Plated. \$ gro. \$27.00 net "Universal"	t Chair Nails Double-pointed Tacks Tap Borers.
The Perfect, Clark & Smith, N. Plated. \$\pi\$ gro. \$\pi\$, zo, on let "Universal" dis 30 \$\pi\$ Hash Weights. Solid Eyes, in \$\pi\$ b lots and over. \$\pi\$ b 1\pi\$ (ene Sansange Stuffers or Fillers. \$\pi\$ doz \$\pi\$, dis 40 \$\pi\$ (miss "Challenge"). \$\pi\$ doz, No. 15; No. \$\pi\$, \$\pi\$, dis 20 \$\pi\$, perry. \$\pi\$ doz, No. 15; No. \$\pi\$, \$\pi\$, dis 20 \$\pi\$, 20 \$\pi\$ Draw Cut No. 4	Tap Borers. Common and King. Ives Tap Borers. Enterprise Mfg. Co. Tapes, Measuring. American. Spring. Chesterman's. regul
Perry Cut No. 4 dos. No. 15; No. e, \$21, dis 2c&5 5 Draw Cut No. 4 each \$30.00, dis. 20 6 Enterprise Mfg. Co. dis 20 6 10 20 6 10	Tapes, Measuring, American
Silver's dis 25 % Na wa. Dission's Circular, Will and Cross Cut	Tnermometers.
Boynton's Lightning Cross Cuts, new list dis 40 % Boynton's Circular and Mill	Tobacco Cutters, Enterprise Mig. Co. (Champion) Wood Bottom
Boynton's Lightning Hand, Panel and Rip	Nashua Lock Co.'s
Livingston's Framed Wood— Livingston's Framed Wood— Nos	Toe Calas. Winsted. Tippers' Toels and Machines
Peace Circular and Mili	Tinners' Tools and Machines Machines (P. S. & W.). list Tools (P. S. & W.). List Transom Litters.
Peace Band Oswar Richardson's Circular Richardson's Mill and X Cut. dis 40 % Richardson's Hand Panel, Buscher and Web	Transom Lifters. Wollensak's Patent. Reiher's Patent, new list, Feb., 1832 Excelsior.
Enterprise Mrg. Co. Slaws. Slaws. Disston's Circular, Will and Cross Cut. dis 45 % Disston's Circular, Mill and Cross Cut. dis 45 % Disston's Circular, Mill and Cross Cut. dis 45 % Boynton's Lightning Cross Cuts, new list. dis 45 % Boynton's Circular and Mill. dis 45 % Boynton's Lightning Hand, Panel and Rip. dis 45 % Boynton's Lightning Hand, Panel and Rip. dis 45 % Wheeler & Clemson Mrg. Co. Stand. dis 35 % Wheeler & Clemson Mrg. Co. Stand. dis 35 % Wheeler & Clemson Mrg. Co. Stand. dis 35 % Livingson's Butcher and Ribchen. dis 25 % Livingson's Framed Wod. Livingson's Framed Wod. Per don. 10 105 104 Per don. 10 105 Per don. 10	Traps. Game. Newhouse Game. Oneida Pattern. Game. Blake's Patent. Mouse, Wood. Choker. Mouse, Round Wire. Mouse. Catch-emailve Mouse. Catch-emailve Mouse. Catch-emailve Trowells.
Saw Rods	Mouse, Wood, Choker
Boynton's Patent & Cut, per Gos, \$12.00; Hand Saw per Gos, \$10.00	Mouse, "Bonanza" pe Bat, "Decov"
Leach's	Lothrone' Brick and Plastering
Nash's	Peace's Plastering. Clement & Maynard's
Aiken's Genuine \$13.00, dis 506.10 \$ Aiken's Imitation \$7.00, dis 50.00 Hart's Patent Lever dis 20.5	Worrall's Brick and Plastering Garden Triers.
	Trucks (Warehouse, &c.
Scales Section Secti	Penneid Blook Co.'s list, 1882. V 1893. V 1893. V 1804. Solid Crown" (A. H. Hilidick)
Ruffalo Scale Ce	Solid, Peter Wright's Solid, Wilkinson's Parallel, Parker's
Chatillon's Grocers'	Parallel, Wilson's Parallel, Howard's Parallel, Merrill's
Family, Turnbull's. dis 30% Scale Reams, List of January 12, 1883. dis 33% kto 8 Scrapers.	Parallel, Backus and Union
Adjustable Box Scraper (8. R. & L. Co.), \$6.40, dis 202105 Box I Handle \$ dox \$2.00, dis 10 5 Box 2 Handle \$ dox \$6.00, dis 10 5 dis 200105	Parallel, Prentiss. Parallel, Simpson's Adjustable "Family," List.
Scrapers. Scrapers. djustable like Scraper (S. R. & L. Co.), \$5.40, dis sociof. dyustable like Scraper (S. R. & L. Co.), \$5.40, dis sociof. Box 1 Handle	Saw Filers, Stearn's
Screen Cerners. Porter's Pat Windowand [Door Frame dis 334] Screw Drivers. Donales Mr. Co	Richardson's Vise and Anvil
Ship. Providence Tool Co	Washer Cutters. Smith's Patent. Johnson's. P dos Penny's. W dos Pol. \$17.40; Jap' Appleton's. W dos &
Stanley Rule & Level Co. 8, Varnished Ruls. dis 0210 3 Stanley Rule & Level Co. 9, Black Handles, dis 0210 8 Sargent & Co. 8. dis 50210 8	Washers.—See Nuts and Washers. Well Wheels
Gay's Double Action Ratchet ** dos., 4 in., \$0.00; 5 in., \$10.00; 6 in., \$12.00—dis 35 \$ **Mallett & Co. 's Double Action Clutch *** dos., 4 in., \$7.00; 5 in., \$6.00; 6 in., \$9.00—dis 45 \$ Champion	Wire. Brass and Copper. Market, Bright and Annealed. Market, Coppered. Market, Gaivanized. Market, Gaivanized. Market, Tinned, Tinned list. Stone, Bright and Annealed, Nos. o to Stone, Bright and Annealed, Nos. o to Stone, Gaivanized, Nos. to to Stone, Gaivanized, Nos. to to Stone, Tinned, Tinned list. Tinned Broom Wire. Cast Steel Wire.
Charpion. dis 25 % Clark's Patent. dis 25 % MCFEWWS. new list. Dec. 27, 1882. dis 50%;0 %	Market, Galvanized
Carr's Patent. Acres 4. Acres 4. Acres 4. Acres 5. Acres 5. Acres 6. Acres	Stone, Bright and Annealed, Nos. 19 to Stone, Bright and Annealed, Nos. 17 to Stone, Galvanized, Nos. 19 to 30
Brass and Silver Capped	Tinned Broom Wire
Dozell, Parent Office Const. Cons	Tinned Stoom wire. Cast Steel Wire. Annealed Fonce, Nos. 8 & 9. Annealed Grape, Nos. 10 to 14. Fence Staples. Stubs Steel Staples. ### Apanned Arth Fence. ####################################
Bench, Iron. \$\\\\\$ dor \$\\\\\$_3.00, dis 10 \\\\\\$ Bench, Wood, Beech. \$\\\\\\$ dor \$\\\\\$_3.00, dis 10 \\\\\\\$ Bench, Wood, Hickory. \$\\\\\\$ dis 20\$\\\\\\\\$ 10\$\\\\\\\\\\\\\\\\\\\\\\\\\\	Japanned Barb Fence
Hand Rail, Eargent's	Japanned Bard Fence. Steel Music Wire, Nos. 7 to 30 Judd's Picture Wire, Nos. 26 to 30 Clothes Line Wire, Galvanized Wire Closh, green, drab and black, w
Screw Window Baiancies. R. B. Hugunin's, No. 1, \$2.10; No. 2, \$1.75; No. 3	Wrenches. American Adjustable Baxter's Adjustable "S," list Jan., sile Baxter's Diagonal
Scref Saws	Coes ' Mechanics''
Lester, \$10.00	Coes' Pattern Wrought. Girard Standard. Girard Agl. Semils & Call's Patent Combination Remis & Call's Marrick Pattern. Bemis & Call's Horrick Pattern. Bemis & Call's Higher Pattern. Lemin & Call's Cylinder or Gas Fipe. Altern Pocket (Bright). The Favorite Pocket (Bright). Webster's Pattent Combination.
Tinners'	Remis & Call's Merrick 'sPatterh Bemis & Call's Brigg's Pattera Bemis & Call's Cylinder or Gas Pipe
Heinsch's Tailor's Shears	Van Wagoner & Williams' Basin
Sliding Door, M. W. & Co., list	Wringera, Universal, XX, No. 214
diding Door, Fatent Foller, nation 3 dis cocrose & diding Door, Russell's Anti-Friction dis cocrose & diding Door, Moore's Anti-Friction dis c & Biding Shutter, R. & E. list dis socrose &	Universal. XX, No. 134 Universal. XX, No. 1. Peerless, no Cegs, No. 1
Sheaves. Sidding Door, M. W. & Co. Hist	Peerless, with Cogs, No. 214
Shovels and Spades. Ames. New Hat, July 1, 1881	Eureka, No. 2
erimins dia 18 d	Writers Fers. No. 2/6. Universal, XX, No. 1/6. Peerless, with Cogs, No. 1. Peerless, with Cogs, No. 2. Peerless, No. 3. Peerless, No. 2. Peerless, No. 2. Peerless, No. 3. P
Services and the services are services and the services and the services and the services are services and the services and the services and the services are services and the services and the services are services are services and th	The state of the s

	B1 -	
5	Shovels and Tengs. fron and Brass Head, R. & B. list dis too red fron and Brass Head, P. S. & W	ta
40 5	Aquare Frames, by casedis	70
A K	Spoke Shaves. dis zo& tron dis zo& tron dis zo dis yood dis Shaley is (Stanley R. & L. Co.), new list dis yo& Stearns' (Stanley R. & L. Co.), new list dis yo& dis yok	
***	Stearns Stearns F dos \$10.00, dis 200.	10
	Ives'No. 1, \$15.00; No. 2, \$12.00 \(\text{if doz, dis 55\text{\text{\$\chi_{\text{Nonlass}}}}} \) Douglass'\(\text{if doz \$\phi_{\text{0.00}}\$, oo, dis } \) Spoons. Basting\(\text{dis \$6\text{\text{\$\chi_{\text{0.00}}\$}} \)	10
5	Douglass* \$\ \phi\$ dos \$\ \chi_0\$, co, dis \$\ \text{Mposums}\$. Basting dis 6\chi_8\$ biveted Table and Tea dis 6\chi_8\$ fiveted Table and Tea dis 6\chi_8\$ solid Table and Tea dis 6\chi_8\$ fiveted \$\ \text{Berd & Barton}\$ dis \$\ \chi_8\$ fiveted \$\ \text{Berd & Barton}\$ dis \$\ \chi_8\$ fiveted \$\ \text{Gart Steel, Silver Pinton}\$ dis \$\ \chi_8\$ fiveted \$\ \text{Cast Steel, Silver Pinton}\$ dis \$\ \chi_8\$ fiveted \$\ \text{Cast Steel, Silver Pinton}\$ \$\ \text{Bissing Tables}\$ dis \$\ \text{Tin}\$ (Cowles Hdw Co.), case lots dis \$\ \text{Tin}\$ (Cowles Hdw Oo.), case lots dis \$\ \text{Bissing Tables}\$ dis \$\ \text{Silver Bissing Tables}\$ dis \$\ \te	10
	German Silver. dis 30&104 German Silver. dis 30&104 Cast Steel, Silver Plated. dis 30 Tin (P. S. & W.), Tess. \$1.25 \(\text{W} \) gross, Tin (P. S. & W.), Tables \$2.00 \text{Pross.}	15
00000	Tin (Cowles Hdw. Co.)	010
20 20 20 20 20	Mightaling "Screw Plate dis	000
	Washita Stone No. 1, ₩ 2 18c Washita Stone, Slips No. 2, ₩ 3 10c Washita Stone, Slips No. 1, ₩ 3 37c Arkansas Stone No. 1, 4 to 6 in ₩ 3 \$1.35	ne ne
	Arkginski Stone No. 1, 8to 9 lm.	0 0
-	Grindstones, Family, Loring'sdis : Stove Polish. Joseph Dixon's	0
	Stove Polish.	5
	Dixon's Flumbage	. :
	Squares. Steel	% (B)
	Tacks, Brads, &cc. New List, Sept. 1, 1882.	0 1
	Winterbottom's Trv and Mitre dis 20&2 Tacks, Brads, &c. New List, Sept. 1, 1882. Tinned Swedes Tacks dis 30 % Tinned American Tacks dis 30 % Swedes Hands, all kinds dis 30 % Swedes Hangarian Natis dis 30 % Swedes Hungarian Natis dis 30 % Swedes Hungarian Natis dis 30 % Swedes Hungarian Natis dis 30 % Trunk and Clout Natis. Copper Tacks and Malis dis 30 % Trunk and Clout Natis. Copper Tacks dis 30 % Trunk and Clout Natis. Common and Patent Brads dis 20 % Brush Tacks dis 20 % Brush Tacks dis 20 % Clear Box Natis. Clear Box Natis. Clear Box Natis. Clear Box Natis. Chair Natis. Chair Natis. Chair Natis. Chair Natis. Chair Natis. Chair Natis. Common and Septent Secks. Chair Natis. Clear Box Natis. Clear Box Natis. Chair Natis. Chair Natis. Compone and Kinse. Common and Kinse. Common and Kinse. Common and Kinse. Common and Recommon	BX.
-	Swedes Hungarian Nails	NOT BUT
	Trunk and Clout Nails dis 25 % Common and Patent Brads dis 20 % Basket Nails dis 20 % Brush Tacks dis 20 % Common and Patent Brads dis 20 % dis 2	OD ALL
	Leathered Carpet Facks dis 20 \$ Clear Box Nails dis 20 \$ Chair Nails dis 20 \$ Chair Nails dis 20 \$ Double-pointed Tacks dis 20 \$	53
	Ives Tap Borers	1
	American dis 20 Spring dis 24 kg Chesterman's requiar list dis 20 (2)	XXX
1	Tin Case disarking	4
-	Tobacco Cutters, Enterprise Mig. Co. (Champion)	MEXE
	Winsted # D 9c, dis	5
A	Transers Tools and machines. acchines (P. S. & W.)	*
N GC	Traps. dis 50 tions dis 50 tion	* *
C A A	Traps	5 C K C
MAL	iouse. Catchem-alive	
LHER	othrops' Brick and Plastering dis 25 teed's Brick and Plastering dis 15 bisston's Brick and Plastering dis 25 eace's Plastering dis 25 eace's Plastering dis 25	
CHEVO	iat. "Decoy". dos sie.cc, dis ico. Trewels. othrops' Brick and Plastering. dis 25, othrops' Brick and Plastering. dis 25, lesed's Brick and Plastering. dis 26, jisston's Brick and Plastering. dis 26, ence's Plastering. dis 26, lement & Maynard's di	
B	Triers. utter and Choosedis 255 Trucks (Warehouse, &c.	
1 8	Visco	
BSPP	olid, Peter Wright's	
PPP	arallel, Howard's dis 20210 2 arallel, Merrill's dis 16 2 arallel, Sargent's dis 60210 4 arallel, Backus and Union dis 40 5	
PPP	araliei, Double Screw Leg	
84 84 84	aw Filers. Bonney's	
CAR	enfield Hook Co.'s list, 1892. Solid Box dis 35 Solid Box dis 35 Solid Box dis 35 Solid "Crown" (A. H. Hildick) de to 100 B, 150 net Dild "Crown" (A. H. Hildick) de to 100 B, 150 net Dild "Peter Wright's dis 100 B, 150 net Dild Peter Wright's dis 100 B, 150 net Dild Peter Wright's dis 100 B, 150 net Dild Wilkinson's dis 105 erailed, Peter S Saralled, Parker's dis 205 10 S aralled, Peter I's dis 205 10 S aralled, Howard's dis 205 10 S aralled, Sargent's dis 205 10 S aralled, Frentiss dis 205 10 S arall	
Pe	Washer Cutters. Washer Cutters. Washigh's Patent. Washigh's Agent County Cou	
	Wall Wheels district	-
M. M. St.	arket, Coppered	
it.	one, Bright and Annealed, Nos. 19 to 26 dis 60@ 69% 8 one, Bright and Annealed, Nos. 19 to 36 dis 65 & 696 8 one, Galvauized, Nos. 19 to 30	
LI LI	nned Broom Wife	
e e	Wire. dis 30 5 arket, Bright and Annealed div 525 6 5 5 5 arket, Bright and Annealed div 525 6 5 5 5 arket, Coppered dis 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
u	dd's Picture Wire, Nos. 16 to 30	-
n	Wrenches. dis 44 % xters Adjustable dis 20% 5 % xter's Adjustable dis 20% 5 % xter's Disgonal dis 20% 5 %	2 11 11 10
i.	Xter's Diagonal. es' Genuine	

		7
5	Shevels and Tengs. t fron and Brass Head, P. & R. list, dis to&to&to&fron and Brass Head, P. S. & W	2 %
1400 15	Aquare Frames, by casedis	0 %
典 男男男	1701	5%0%
光異属 咒话	Speke Trimmers. # dos \$10.00, di4 40&	5%
5	Basting	00505
666	Holmes, Boeth & Haydens, dis acknow German Silver. dis acknow Cast Steel, Silver Piated dis 32 Tin (P. S. & W.), Teas. \$2.29 gross, t Tin (P. S. & W.), Tables. \$2.00 gross, t	5 % 5 % set let
0000	"Lightning" Screw Platedis I	0%
0000000	Hindostan No. 1, 6c; Axe, 8c. dis 4 Hindostan Hacker Stene # gross \$12.00 dis 18 Sand Stone # 50c, dis 335-5t. Washita Stone No. 1, # 5 lec n Washita Stone No. 2, # 5 lec n	o %
5 6	Washita Stone, Slips	et et et ex ex
2 2 2 2 2	Grindstones, Family, Loring's dis it Stave Pelish. Stave Pelish. Joseph Dixon's \$6.00, dis no Gem. \$7.00 gross \$6.00, dis no Gem.	2 × × ×
	Stave Polish # gross \$6.00, dis to Gem # gross \$4.00, dis to Gem # gross \$4.00, dis to Gem # gross \$4.00, dis to Gold Medal # gross \$6.00, dis to "Mirror" # gross \$6.00, dis to "Mirror" # gross \$6.00, dis to "Mirror" # gross \$5.75, no Rising Sun # gross \$5.75, no Dixon's Plumbare # b 80, no Dixon's Plumbare # b 80, no gamal, \$3 :No 3, medium, \$4.	iet et et a,
	Squares. Steeldis 50 %; full cases, dis 40&10 %; Steeldis 50 %; full cases. dis 50&10 %; Casesdis 50&10 %	sh %
	Tacks, Brads, &c. Tinned Swedes Tacks. dis 30 \$1 Tinned Swedes Tacks. dis 30 \$1	75
	Tacks, Brads, &c. I New List, Sept. 1, 1882. Tinned Swedes Tacks. dis 30 \$ Tinned American Tacks. dis 30 \$ Swedes Tacks, all kinds. dis 30 \$ American Cut Tacks. dis 30 \$ American Cut Tacks. dis 30 \$ Copper Tacks and Nalls. dis 30 \$ Gimp and Lace Tacks. dis 30 \$ Gimp and Lace	Extra:
	Graph and Lace Faces, Finned Gls 30 S	TO % OD ALL
	Cigar Box Nails	37
The second second second	Tap Borers. dis 20 Common and King. dis 20 Ives Tap Borers. dis 15210 Enterprise life. dis 20210 Tapes, Measuring. dis 20210	** ×
	Tapes, Measuring. American dis 20 Spring dis 20 Chesterman's regular list dis 20 Thermometers. The Case. dis 74810	W XX
	Tobacco Cutters, Enterprise Mrg. Co. (Champion)	MANAM
	Tee Chias. Winsted. P D 9c, dis Tinners' Tools and Machines. Machines (P. S. & W.). list add res Tools (P. S. & W.). add 6 5 dis 10 9	
	Wollensak's Patent dis 35 5 Reiher's Patent, new list, Feb., 183, dis 202 10410 9 Excelsior. dis 502102 2	-
	Traps. Game. Newhouse	
-	Mouse Cage, wire # dos \$2.50, dis 10 5 Mouse, Catchemalive # dos \$2.50, dis 10 5 Mouse, "Bonanza" per gross \$5.00 net bat, "Bocov". # dos \$10.00, dis 10 5 Trowels.	
the same of the same	Travels. Lothrops' Brick and Plastering dis 25 g Reed's Brick and Plastering dis 15 g Reed's Brick and Plastering dis 15 g Peace's Plastering dis 20 g Peace's Plastering dis 20 g Peace's Plastering dis 20 g Reed's Maynard's dis 20 g Rose's Brick dis 15 g Brades' Brick dis 25 g Rose's Brick dis 25 g Rose's Brick dis 25 g Reed's B	
1	Rutter and Cheese	313
1	Trucks (Warehouse, &c., Penniel Blook Co., 11st, 1882	
SHIT	Solid, Peter Wright's 1346 Solid, Wilkinson's 14614c Faraliel, Parker's dis 105 Paraliel, Wilson's dis 105 Paraliel, Wilson's dis 205 Saraliel, Wilson's dis 205	
HHHHH	Parallel, Merrill's disrcs Parallel, Sargent's dia 6x8to 5 Parallel, Esckus and Union dis 20 Parallel, Oval Silde dis 20 Parallel, Oval Silde dis 20 Parallel, Ouble Screw Leg dis 158to 5	
MINIST SECOND	"arailei, Frentsas Parallei, Simpson's Adjustable dis 26& 5 Family," List nu saw Filers, Bonney's. \$\psi\$ dos \$\frac{2}{3} \text{4.80}, \text{dis 20& 6.5} saw Filers, Stearn's. dis 20& 6.5 saw Filers, Stearn's. \$\psi\$ dos \$\frac{2}{3} \text{4.80}, \text{dis 20& 6.5} saw Filers, Stearn's. \$\psi\$ dos \$\frac{2}{3} \text{4.80}, \text{5.80} saw Filers, Stearn's.	
BOR	Pennield Block Co.'s list, 1882. Visco. Visco. Solid Box. Solid "Crown" (A. H. Hildick)	st
3 PA	ohnson's. \$\phi\$ dos Pol. \$\pi_1, \lorer \] Jap'd, \$\pi_1, \lorer \] jap'd, \$\pi_1, \lorer \] Jap'd, \$\pi_1, \lorer \] is \$\lorer \] Washers. \$\phi\$ dos Pol. \$\pi_1, \lorer \] dos \$\pi_1, \lorer \] is \$\lorer \] is \$\lorer \] Washers.	i
	AA GUT AA HEGERSON ON OUR TO DE	-
M 51 51 51 51 51	Tarket, Tinned, Tinned list. tone, Bright and Annealed, Nos o to tild s vis 57% tone, Bright and Annealed, Nos o to tild s vis 57% tone, Bright and Annealed, Nos. 17 to 26. dis 60% 50% tone, Bright and Annealed, Nos. 27 to 36. dis 60% 50% tone, Galvanized, Nos. 19 to 30. dis 60% 50% 50 tone, Galvanized, Nos. 19 to 30. dis 60% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	1
SITCAA	Wire. Irass and Copper	-
31	ence Staples daivanised 9 5 4 6 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	TAE
	add's Picture Wire, Nos. 10 to 30	of be o
No No No	Wrenches dis 45 merican Adjustable dis 265 axter's Adjustable dis 265 axter's Disgonal dis 265 axter's Disgonal dis 265 026 dis 265 026 dis 265 028 dis 265 029 dis 265 020 dis 265 020 dis 265 02 dis 265 03 dis 265 04 dis 25	le

AN	IMPROVED
LEVELIN	G INSTRUMENT.

PRICE OF INSTRUMENT COMPLETE, \$20.

Adapted to the use of Architects, Engineers, Masons Bulloers, Farmers and others.

This instrument is made of Brass and iron, furnished with both masons' (short metal) and surveyors' tripod, and put up in a handsome wooden box, with strap. The only low priced Level that can be tnoroughly adjusted in the field.

A NEW LEVELING ROD. This root is round and made in two sections; is united by a solid screw joint, as if of one length, and has a target. There are two scales, one side being Engineers (feet, isths and noths) the other Architects scale (or, feet, inches and 8ths). Price, \$6.

WM. T. COMSTOCK, Manufacturer, 6 Astor Place, New York.

Circulars and discount to hardware trade furnished to dealers sending their card.

The Iron-Masters'

inalysis of Ores of Iron, Pig and Manufac tured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia. With Branch at Warrenton, Virginia, J. BLODGET BRITTON.

This laboratory was established in 1966, at the instance of a number of practical from Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS. For determining the per cent. of Pure Iron in an ordinary Ore. \$4.00

For the per cent. of Pure Iron, Sulphur and Phosphorus in do. 12.50

For each additional constituent of usual oc

For determining the constituents of a Clay, Slag, Coke, or of an Ash in Coal the charges will correspond with those for the constituents of an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

stances.

Printed instructions for obtaining proper average samples for analysis furnished upon application

B. S. RANDOLPH,

H. S. HANDOLPH,
C1v11 Engineer and Geologist,
MARTINSBURG, W. VA.
Examination of and Reports on Mineral, Railroad and other property. Surveys Mapa, Plana,
Designs, Calculations and Estimates for all kinds
of Engineering Works. Refers to Wm. Keyper,
Battimore, Md.; W. W. Evans, C. E., New York;
Hon. H. G. Davis, Piedmont, W. Va.; Hon. J. N.
Camden, Parkersburg, W. Va.; Jas. L. Randolph,
Chief Engr., B. & O. R. R., Baltimore, Md.

Self-Binders for The Iron Age



We are now prepared to supply our sub-scribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered. Addres all orders to DAVID WILLIAMS,

83 Reade street, New York.

COVERINGS

The Best Boiler and Pipe Covering Made!



THE CELEBRATED PATENT AIR SPACE COVERING for Steam Boilers and Pipes, Hor BLAST PIPING, &c., &c.

TOOPE'S PATENT ASBESTOS-LINED REMOV-



NATIONAL STEEL TUBE CLEANER for cleaning Boiler Tubes Saves its cost every time it is used, and is endorsed

ASBESTOS MATERIALS, FIBRE, MILLBOARD, PACKING AND CEMENT. Address CHALMERS SPENCE CO., GERMANIA BANE BUILDING. 23 John St., N. Y. Pittsburgh, Pa.

HAND BONE MILL. Grinds bones GREEN or DRY. (Frank Wilson's Pat.) Prices from \$5 to \$15. For the Poul tryman, Gardener and Farmer. Send for illustrated circulars and testimonials to

WILSON BROS., Sole Mfrs., Easton, Pa., U. S. A. Special cash discount to the trade.

& E. Y. MOORE,

163 & 165 LAKE ST., CHICAGO,

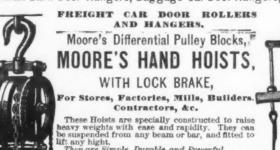
AGENTS FOR

Rhode Island Tool Co., The Pennsylvania Bolt and Nut Co., Wm. H. Haskell & Co., Hotchkiss & Upson Co., Black Diamond File Works, Syracuse Bolt Co., Saranac Horse Nail Company, Columbus Bolt Works, Penfield Block Co., MANUFACTURERS OF

GIMLET POINT COACH SCREWS, THRESHING MACHINE TEETH.

Wood Screws, Files, Horse Nails, Rope and Iron Strapped Blocks, Iron Tackle Blocks, Turn Buckles, Ship Chandlery Hardware, &c. Also Manufacturers of

Climax Barn Door Hangers, Baggage Car Door Hangers, Sliding Door Sheaves,



any position.

We make these Hoists in two sizes, 600 pound size and 1200 pound size. Send for Price List. S. H. & E. Y. MOORE,

urt any hight.

They are Simple, Durable and Powerful.

The Lock Brake will hold the load suspended in the powerful.

163 & 165 Lake St., Chicago. EASTERN AGENCIES FOR

"Climax" Hangers Differential Blocks, &c., &c., HENRY B. NEWHALL, CO.,

105 Chambers St., 47 Pearl St., NEW YORK. BOSTON, MASS. (J. H. WORX, Manager.)



PORTABLE FILTER

COMBDIES,



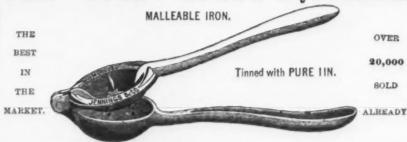
ż Buffalo, SONS, 8 B **JEWETT** ت



tion to the wheel, joyous exercise to the case is a genuine, useful and beautiful novelty. Sold by the rade everywhere, Send for circuiar.

JOHN C. JEWETT & SONS, Buffalo, N. Y.

THE "STAR" LEMON SQUEEZER.



We offer the STAR LEMON SQUEEZER to the trade, confident that in all escential points it excels any other in use. One great advantage it possesses over all others is the greater length of handles, making it much casier to do the work. Packed in neat wooden boxes of $\frac{1}{2}$ dozen each. One gross in a case.

C. E. JENNINGS & CO., Proprietors, 96 Chambers St., New York.

McCULLOUGH, WOODBURY & CO., MANUFACTURERS OF



EXANDER PHILADELPHIA.

Elizabethport Steam Cordage Co., MANUFACTURERS OF MANILA, SISAL AND TARRED

CORDAGE OF ALL KINDS.

BINDER TWINE A SPECIALTY. M. FULTON. R. WHITLOCK W. LUKENS. 46 South Street, New Yorks

NEW YORK WHOLESALE PRICES, May 9, 1883.

All Mandrel Drawn Tubes under % in. 25 cents pound advance.

ZINC TUBING—dis. 25 %.

2d quality..... 3d quality...... ANTIMONY

METALS.

IRON.—Dutt. Bars. 1 to 14cc. W b. Sheet, in Hoon and Scroll, 14 to 14cc. W b: provided, that no of the above from shall pay a less rate of duty it as per cent. Pig. 37 W ton: Pollshed Sheet, 3c. W Wrought Scrap, 38 W ton: Cast Scrap, 36 & ton. R touch 70c. W 100 b. Boller and Plate. 14cc. W b	
of the above Iron shall pay a less rate of duty the	and .
or now cant Die de St ton : Dollahart Shaat so M	ann
Wrought Scrap, 88 % ton; Cast Scrap, 86 % ton. R	all:
American Tren Foundry, No. 1x	
Gray Forge	0,00
Frinton	2 00
Carnbroe 2	-75
Gicngarnock	4.00
Langioan	1,50
	1.00
h n i n	50
Wought, P ton, from ship and yard 23.00 @ 26	
Bar Iron From Store.	-
% to 1 in. round and square P B 2.16 & 2.	30e
Rafinad from	
1 to 6 in.x34 to 1 in	44C 55C
Rods—% and 11-16 round and square. # \$2.45 @ 2. Bands—1 to 6x3-16 to No. 12	30
1 to 6 ln. 3% to 1 ln	Me
	n.
Nos 10 to 20.	
27	
Galvanized to to 20	al.
Galvanized 21 to 24 # m 8540 7540 Galvanized 25 to 26 # m 9 0 8 0	
3a vanized. 27 9 5 940 8340 Ga vanized. 28 9 5 10140 9 6	
27.	40
(1) PPR, -Duty: Pig, Bar and Ingot, se: Old Co	D
Rustla	*
ad valorem. American Ingot	8.
Puzier Copper. ordinary sizes. 16 es. per sq.	000
And over 12 OL, W sq. ft B 3	oc
Braziers' Copper, 10 oz. and 12 oz., # sq. ft # h 3 Braziers' Copper, Lighter than 10 oz. # sq. ft # h 3	ac 40
Circles is in diameter and over	4C .
l ocomotive Fire Box Sheets	90
Solit Copper	BC I
so Copper is Sheathing except 14x48 inches, and no to exceed 34 oz. to the sq. ft.	ot
TINNING.	Sen !
Aheets 14 X 28. All other size Sheets, 1 to F sq. ft. For thining both sides, double the above amount. O'BEILS PATENT FLANISHED COPPER.—Net.	
O'REILS PATENT FLANISHED COPPERNot.	. 1
14 and 16 on and heavier. \$ B 370 By the case. \$ B 3 By the case. \$ B 3 By the case. \$ B 3 By	Se pe
jn., 14x 52. 8 in., 14x 65. 9 in. 14x 60.	
in. 14x42. Sin., 14x65. ein. 14x66. 14 and 15 oz. and heavier \$\Pi\$ 350 By the case. \$\Pi\$ 36 (And all sizes not over 20 in. wide.)	Be :
13 and 16 oz. and heavier	ie !
RRASS.	
	10
Pround Sharp's Gauge the Standard for Metal Old English Gauge the Standard for Wire.	10
Old English Gauge the Standard for Wire. BRASS MANUFACTURERS' PRICE LET Cls. 30 5. June 19, 1880.	e.
Cash prices for Roll and Shoot Brass. For less quarties than too he add 30. \$ h.	e.
C:sh prices for Roll and Shoot Brass. For less quanties than noo he add 36. Wh. A'l Nos. not thinner than No. 38, wider than 1 ln.,	B-
C: sh prices for Roll and Shoot Brass. For less qual ties than so he add 36. Wh. HIGH BRASS. A'I KOS. not thinner than No. 28, wider than 2 in., not wider than is in. Att. on to No. 28, inclusive, and widths over 15 to 20 tim inclusive.	B- 1
Cosh prices for Roll and Shoot Brass. For less quanties than soo he add 36. \$\pi\$ h. A'I NOS. not thinner than No. 28, wader than 2 in., not wider than 1 in. At NOS to No. 28, inclusive, and widths over 14 to 20 in. inclusive.	B- 1
C:sh prices for Roll and Shoot Brass. For less qual ties than so he add 36. Wh. HIGH BRASS. A'I Kos. not thinner than No. 28. wider than 2 in., not wider than to lin. Att. os. to No. 28. inclusive. and widths over 14 10 20 im inclusive. To No. 28. inclusive. and widths over 15 10 20 it. inclusive. A'I Nos. to No. 28. inclusive. and widths over 20 to 30 it. inclusive.	n-
C:sh prices for Roll and Shoot Brass. For less qual ties than so he add 36. Wh. HIGH BRASS. A'I Kos. not thinner than No. 28. wider than 2 in., not wider than to lin. Att. os. to No. 28. inclusive. and widths over 14 10 20 im inclusive. To No. 28. inclusive. and widths over 15 10 20 it. inclusive. A'I Nos. to No. 28. inclusive. and widths over 20 to 30 it. inclusive.	n-
Cash prices for Roll and Shout Brass. For less quanties than so he add 36. Wh. A'I NOS. not thinner than NO. 28, wider than 2 in., not wider than 1 in. At one to NO. 28, inclusive, and widths over 12 10.29. A'I Nos. Cast of No. 28, inclusive, and widths over 12 10.29. A'I Nos. A'I I mar thinner than NO. 38 is Platers' Brass. at. 42 th ess 24.28, and all sheets cut to particular sires and lengths under 9 sin., in width wider than 2 in. 39	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. Ph. A'I NOS. not thinner than No. 28, wider than 2 in., not wider than 1 in. At NOS. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I NOS. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I NOS. to No. 28, inclusive, and widths over 25 to 30 in. Inclusive. A'I I lorse thinner than No. 38 is Platers' Brass. at. 32 in the set 24x38, and all sheets cut to particular sizes and lengths under 2 sin. In width wider than 2 in. 32 Frinters' Rules. Shouts wider than 50 in. and under 40 in	In-
Cosh prices for Roll and Shout Brass. For less quanties than soo he add 36. Wh. AT NOS. not thinner than NO. 28, wider than 2 in., not wider than 12 in. At NOS. to NO. 28, inclusive, and widths over 12 io 20 in. inclusive. AT NOS. to NO. 28, inclusive, and widths over 12 io 20 in. inclusive. AT NOS. to NO. 28, inclusive, and widths over 12 io 20 in. inclusive. AT I lims thinner than NO. 28 is Platers' Brass. at. 20 in. and inmitted under 30 in., in width wider than 2 in. 37 Fristers' Rules. Sheets witer than 50 in. and under 40 in. C coular Sheets, in diam, from 4 in. to 14, inclusive. 36 in. 20 in. 20 in. 20 in. 30 i	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. Wh. AT Nos. not thinner than No. 28, wider than 2 in., not wider than 14 in. At Nos. to No. 28, inclusive, and widths over 14 to 20 in. Inclusive. AT Nos. to No. 28, inclusive, and widths over 15 to 20 in. inclusive. AT Nos. to No. 28, inclusive, and widths over 15 to 20 in. inclusive. AT living thinner than No. 28 in Platers' Brass. at. 28 in obtained the second of the second and all sheefs cut to particular sires and an absolute poin. In width wider than 2 in., and oner than 2 in. 29 in. and over 14 in. 20 in. and over 15 in. C ccutar Sheets, in diam. from 4 in. to 14, inclusive. 36 in. 39 i	is.
Cosh prices for Roll and Shout Brass. For less quanties than soo he add 36. Wh. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 1 in. At Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. and over 12 to 20 in. and over 12 to 20 in. and over 12 in. A Din. and over 14 in. 20 in. and over 15 in. and over 14 in. 20 in. and over 15 in. and over 15 in. and over 16 in. and over 17 in. and over 18 in. a	
Cosh prices for Roll and Shout Brass. For less quanties than soo he add 36. Wh. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 1 in. At Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. and over 12 to 20 in. and over 12 to 20 in. and over 12 in. A Din. and over 14 in. 20 in. and over 15 in. and over 14 in. 20 in. and over 15 in. and over 15 in. and over 16 in. and over 17 in. and over 18 in. a	
C: th prices for Roll and Shout Brass. For less qualties than so me add 36. \$\pi\$ \$\pi\$. A'I NOS. not thinner than NO. 28, wider than 2 in., not wider than 1 in. At NOS. to NO. 28, inclusive, and widths over 12 io 20 in. Inclusive. A'I NOS. to NO. 28, inclusive, and widths over 12 io 20 in. inclusive. A'I NOS. to NO. 28, inclusive, and widths over 30 to 30 in. inclusive. A'I lives thinner than NO. 38 is Platers' Brass. at. 10 to 10 in. A'I lives thinner than NO. 38 is Platers' Brass. at. 10 to 10 in. A'I lives agask, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 30 in. B'Sheets wider than 30 in. and over 30 in. C cutiar Sheets, in diam, from 4 in. to 12, inclusive. A'' 30 in. A'' 40 in	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. Ph. A'I NOS. not thinner than No. 28, wider than 2 in., not wider than 1 in. At NOS. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I NOS. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I NOS. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I I Irras rithmer than No. 28 is Platers' Brass. at. 26 hets 24.28, and all sheets cut to particular sirse and lengths under 2 sin., in width wider than 2 in. 27 rinters' Rules. Shouts wider than 50 in. and under 40 in. 40 in. and over 14 in. 50 in. and over 14 inclusive. Coular Sheets. in diam. from 4 in. to 14, inclusive. 50 in. and over 14 in. 50 in. 39 in. 60 in. 39 in. 10 Bars. Four cents P is more than High Brass. Guiding Metal, 20 W is more than High Brass. Guiding Metal, 20 W is more than High Brass. (in Bars. Platers' or Gold Metal Sawed. Metal, in with r in. to 15 in. to No. 28, inclusive, re with the contraction of t	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\frac{1}{2}\$. \$\frac	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\pi\$. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 12 in. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 12 to 20 in. inclusive. A'I lives a superior of the superior of	
Cosh prices for Roll and Shout Brass. For less quanties than soo he add 36. \$\pi\$ \$\pi\$. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 14 in. At Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I lims thinner than No. 28 in Platers' Brass. at. 25 in. 45 hets 2428, and all sheefs cut to particular sires and lengths under 20 in., in width wider than 2 in. 37 in. The state of	
Cosh prices for Roll and Shout Brass. For less quanties than soo he add 36. \$\frac{1}{2}\$. \$\fra	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. Wh. A'I Nos. not thinner than No. 28, wider than 1 in., not wider than 1 in. Att. On 10 No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I I I raser hinner than No. 38 is Platers' Brass. at. 26 th ess 24,248, and all sheets cut to particular since and lemeths under 5 sin., in width wider than 2 in., 27 risters' Rules. Sheets wheets in and under 40 in. 44 inclusive. As 10 in. and over 14 25. 45 the and 15 in. C cular Sheets. in diam. from 4 in. to 14 inclusive. 36 25 the 36 45 the 36 in. and over 14 25. 45 the 36 in. and over 15 the 36 in.	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. Wh. A'I NOS. not thinner than No. 28, wider than 1 in., not wider than 1 in. Att. OR. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I I I rose thinner than No. 38 is Platers' Brass. 28. A'I I rose thinner than No. 38 is Platers' Brass. 29. A'I I rose thinner than No. 38 is Platers' Brass. 29. A'I I rose thinner than No. 38 is Platers' Brass. 39. A'I I rose thinner than 10. A'I I rose thinner than No. 28. A'I I rose thinner	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\pi\$ h. A'I NOS. not thinner than No. 28, wider than 2 le., not wider than 11 lin. A'I NOS. to thinner than No. 28, wider than 2 le., not wider than 12 lin. A'I NOS. Control of the c	
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. W. A'I Nos. not thinner than No. 28, wider than 1 in., not wider than 1 in. No. 28, wider than 1 in. Att. On 10 No. 28, inclusive, and widths over 15 to 25 A'I Nos. to No. 28, inclusive, and widths over 15 to 25 A'I Nos. to No. 28, inclusive, and widths over 15 to 25 A'I I I rose thinner than No. 28 is Platers' Brass. 25 A'I I rose thinner than No. 28 is Platers' Brass. 25 A'I I rose thinner than No. 28 is Platers' Brass. 25 A'I I rose thinner than No. 38 is Platers' Brass. 31 A'I I rose thinner than No. 38 is Platers' Brass. 32 A'I I rose thinner than No. 38 is Platers' Brass. 35 A'I I rose thinner than 1 shouth wider than 2 in., 35 A'I I rose thinner than 1 in. 44 A'I I rose than 1 in. 45 A'I I rose than 1 in. 45 A'I I rose thinner than No. 38, 20 A'I I rose than 1 in. 45	BEBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\frac{\pi}{\pi}\$ \$\frac{\pi}{\pi}\$. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 1 in. At Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 20 in. Inclusive. A'I I Irase thinner than No. 28 is Platers' Brass. at. 30 in. and inclusive in the price of the sex 26.28 and all sheets cut to particular sirse and lengths under 20 in. In width wider than 2 in. 30 in. and over 14 in 20 in. Coular Sheets. in diam. from 4 in. to 14 inclusive. 56 in. and over 14 in. 30 in. and over 14 in. 30 in. and over 14 in. 30 in. 30 in. and over 14 in. 30 in.	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\frac{\pi}{\pi}\$. A'I Nos. not thinner than No. 38, wider than 2 in., not wider than 14 in. At Nos. to No. 38, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 38, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 38, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 38, inclusive, and widths over 15 to 20 in. Inclusive. A'I Nos. to No. 38, inclusive, and widths over 15 to 20 in. Inclusive. B advance on each No. 36 to 80. 36 to 36, in. A'I I I Nos. Thinner than No. 38 is Platers' Brass. A I I I Nos. Thinner than No. 38 is Platers' Brass. A I I I I I I I I I I I I I I I I I I	Section of the sectio
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$ \$. A'I NOS. not thinner than No. 28, wider than 10., not wider than 11 in	Section of the sectio
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. W. A'I NOS. not thinner than No. 28, wider than 1 in., not wider than 1 in. A'I NOS. to thinner than No. 28, wider than 1 in., and widths over 1 io 22. A'I NOS. to Mos. 28 inclusive, and widths over 1 io 22. A'I NOS. to Mos. 28 inclusive, and widths over 1 io 22. A'I I was thinner than No. 38 is Platers' Brass. at. of the cas 2 ax 38. and all sheets cut to particular since and lemeths under 2 sin., in width wider than 2 in., and width wider than 2 in., and over 14. A li was thinner than No. 38 is Platers' Brass. at. of the cas 2 ax 38. and all sheets cut to particular since and lemeths under 2 sin., in width wider than 2 in., and over 14. A low Halls. C coular wheets. in diam. from 4 in. to 14. inclusive. 50. A low Halls. Four cents P m more than High Brass. Guiding Metal, & W more than High Brass. Guiding Metal, & W more than High Brass. In Bars. Bear. Bear. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 15 in. thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in. to 16 thinner than No. 28, 20 W 1 advance. Metal, in width in.	B. B
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$ \$. A'I Nos. not thinner than No. 28, wider than 2 in., not wider than 1 in. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I Nos. to No. 28. inclusive, and widths over 12 to 22. A'I I rose thinner than No. 28 is Platers' Brass. 28. A'I I rose thinner than No. 28 is Platers' Brass. 29. A'I I rose thinner than No. 28 is Platers' Brass. 29. A'I I rose thinner than No. 38 is Platers' Brass. 39. A'I I rose thinner than No. 38 is Platers' Brass. 39. A'I I rose thinner than No. 38. A'I I rose thinner than No. 38. A'I I rose thinner than No. 38. A'I I rose than 2 to 12. A'I I rose than 2 to 12. A'I I rose than 2 to 12. A'I I rose than 2 to 13. A'I I rose than 2 to 14. A'I I rose than 2 to 15. A'I r	BERRERE BOOGGOOD III
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. 9 h. A'I Nos. not thinner than No. 28, wider than 1 h. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 tim. Inclusive. A'I I I rose in the state of the sta	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. 9 h. A'I Nos. not thinner than No. 28, wider than 2 h., not wider than 11 h. A'I Nos. to No. 28, inclusive, and widths over 12 to 22 of 11 h. Inclusive. A'I Nos. to Mo. 28 inclusive and widths over 12 to 22 of 11 h. Inclusive. A'I Nos. to Mo. 28 inclusive and widths over 12 to 22 of 12	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. 9 h. A'I Nos. not thinner than No. 28, wider than 1 h. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 In Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 In Inclusive. A'I Nos. to No. 28, inclusive, and widths over 15 to 25 A'I Was to No. 28, inclusive, and widths over 15 to 25 A'I Brass thinner than No. 38 is Platers Brass. 25 A'I Brass thinner than No. 38 is Platers Brass. 25 A'I Brass thinner than No. 38 is Platers Brass. 25 A'I Brass thinner than No. 38 is Platers Brass. 38. A'I Brass thinner than No. 38 is Platers Brass. 39 A'I Brass thinner than No. 38 is Platers Brass. 39 A'I Brass thinner than No. 38 A'I Brass t	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$ \$. A'I Nos. not thinner than No. 28, wider than 10., not wider than 11. 11. A'I Nos. 10 No. 28. inclusive. and widths over 12 to 20. A'I Nos. 10 No. 28. inclusive. and widths over 12 to 20. A'I Nos. 10 No. 28. inclusive. and widths over 12 to 20. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38 is Platers' Brass. at. 40. A'I I lyas thinner than No. 38. A'I lyas thinner than No. 38	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\frac{1}{2}\$. \$\frac	THE REPORT OF THE PARTY OF THE
Cosh prices for Roll and Shout Brass. For less quanticies than so he add 36. \$\pi\$. A'I Nos. not thinner than No. 28, wider than 10., not wider than 11 in	THE REPORT OF THE PROPERTY OF
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. \$\frac{1}{2}\$. \$\frac	SE S
Cosh prices for Roll and Shout Brass. For less quanties than so he add 36. 9 h. MICH MICHAEL ST. MICH	SERVICE OF SECOND SECON

Reds—% and 11-10 round and square. * B 245 @ 246 Bands—1 to 6x3-16 to No. 12	LEAD.—DUTY: Pig. 43 F 100 B Old Lead, 1560 F B.
Common R. G.	American4.55 % 1.000
Nos 10 to 20.	Bar
27	Shot
28.	A. 28e ;B. 25e ; C. 15.
Galvanized, 25 to 26	fin.—Duty Plates, Sheets Tagger and Terne, 1.10 \$\pi\$; Electri-galvanised Plates, \$x \pi\$ \$\pi\$ manufactures of, not cumerated, 35 per cent. ad val. Bars, Block and Pigs free. Banca, subject to duty of 10
Pa ent Planished A	Hlock and Pigs free. Banca, subject to duty of 10 per cent.
Russia. B 13 @ 14e Al erican Cold Holled	Banca
nd valorem.	TER PLATER.
American Ingot	
Puzler Copper, over 12 0a. \$\text{P B 3C}\$ fi. and o of \$\text{P B}\$ fi. and o of \$\text{P B}\$ fi. and o of \$\text{P B}\$ fi. and over 120 copper, ordinary sizes, under 16 0a. and over 120 copper, ordinary sizes, under 16 0a. \$\text{P B 3C}\$ and over 120 copper, 120 c. and 120 a. \$\text{P B 4, fi. }\text{P B 3C}\$ final copper 120 c. and 120 a. \$\text{P B 4, fi. }\text{P B 3C}\$ final copper 120 c. and 120 a. \$\text{P B 4, fi. }\text{P B 3C}\$ final copper 120 c. and 120 a. \$\text{P B 4, fi. }\text{P B 3C}\$ final copper 120 c. \$\text{P B 3C}\$ for the part of	X 10X14 Prime Charcogi
and over 120k, # sq. lt. Ltaziers' Copper, 10 oz. and 12 os., # sq. ft # B 300 Braziers' Copper, Lighter than 10 os. # sq. ft # B 3do	X 14X30 X 12X12, Prime Charcoal 8.25 D U 1216X17, Prime Charcoal 5.75 D X 1216X17, Prime Charcoal 7.25 D X
Circles & in. diameter and over	For each additional X add
I ocomotive Fire Box Sheets	I.C 10X14 } \$5.40 \$4.15 @ 4.40
Boit Copper. # 5 age Copper Bottoms. # 5 31 @ 300 So Copper is Sheathing except 14x48 inches, and not	I C 12X12
to exceed 14 or. to the sq. ft.	1 C 14X20 \$6.25 (g) 5.50 5.25 5.00
Sheets 14 X is	1 X 14x20
O'REILS PATENT PLANISHED COPPERNot.	SOLDER-36 & 36
14 and 16 oz. and heavier. # B 370 By the case. # B 36c	No. 1. 12/90 SPELTER.—DUTY: In Pigs, Bars and Pites, \$1.40
in. 14x43. 8 in. 14x65. 6 in. 14x66. 14 and 16 oz. and heavier \$\psi\$ 350 By the case. \$\psi\$ 36c (And all sizes not over 20 in. wide.)	Fig. 3. American, cash
(And all sizes not over 20 in. wide.) 24x45&30x50. 1; and 16 Oz. and beavior	Sheet, Cask 054 66 0960
RRASS.	Sheet, Open7 @ 7740
Prown & Sharp's Gauge the Standard for Metals. Old English Gauge the Standard for Wire. BRASS MARTFACTURERS' PRICE LIST.—dis. 30 S.	Paper Stock, &c.
C:sh prices for Roll and Sheet Brass. For less quan-	Cente # 8
ties than 100 hs add 36. W h.	White Shirt Cuttings, No. 2
a'l Nos. not thinner than No. 28, wider than 2 in., no: wider than 12 in	Unbleached Muslins 64 6 64 City Whites, No. 1
A'l Nos. to No. 28. inclusive, and widths over so to 30	Unbleached Muslim
ACC . IN BUTANDER OIL ESCH MAY STONE SO NO. 30' IN.	New Seconds, dark
h'il Brass thinner than No. 35 is Platers' Brass. at 43c hh ets 24x45, and all sheets cut to particular sizes	Seconds, City No. 1
Printers' Rules. 450 Shoots wider than 50 in. and under 40 in. 470	Manifa Rope
C cular Sheets, in diam, from 4 in, to 14, inclusive400	Gunny Bagging, No. 1
nd lengths under 30 in., in width wider than 11. 370 Printers Rules. 450 Shoots wider than 50 in. and under 40 in. 470 Sincots wider than 50 in. and over 500 C coular Sheets, in diam. from 4 in. to 14. inclusive. 400 20 20 30, 440 20 30 46, 500 20 40 in. 500 20 40 in. 500	Buriap Bagging, No. 1. 214 66 252 Tar Shakings. 2 66 214
LOW BRADE.	No. 2 Writes
Cuiding Metal, Sc W b more than High Brass. In Bars. 48c Platers' or Gold Metal Sawed Suc Planed or Polished Sec Planed or Polished Sec	White Shavings, No. 2, soft
FUE SLITTING.	Book Stock, No. 1, light
Metal. in width 1 in. to 1/2 in. to No. 28, inclusive, 10 W B. (4 Ance. Metal. in width 2 in. to 1 in. thinner than No. 28, 20 W B.	Pure Manlias 2 2 24
Triviality and Triviality of the Control of the Con	
advance. Vetal, in width rin. to 14 in. thinner than No. 18, 90 P B	Commons per see lbs
victal, in width rin. to % in. thuner than No. 10, ye w D	Bluders' Hoard Cuttings 1 66 156 Straw Board Cuttings 1 66 36
wees, in width 14 in. to 35 in. thinner than No. 38, 32 w b ndvance. Seem in width 15 in. to 35 inclusive, not thinner than No. 38, 2 w w n advance. Setal in width 15 in. to 35 thinner than No. 36, 50 W n	Paints, Oils, &c.
ween, in width 14 in. to % in. thinner than No. 26, 27 w b ndvance. No. 26, 27 w n advance. No. 26, 27 w n advance. Notal, in width % in. to % thinner than No. 26, 40 w n dvance. Metal, & in. in width and less, 100 P & advance. Any of the above widths cut to particular lengths, add 22 F B.	Paints, Oils, &c.
where, in width 14n, to % in, thinner than No. 28, 27 * B advance. **Motion in width 14 in, to %, inclusive, not thinner than No. 28, 27 * B advance. **Motal, in width 14 in, to % thinner than No. 28, 40 * B advance. **Motal, 14 in, in width and less, 100 * B advance. **Motal, 14 in, in width and less, 100 * B advance. **Motal, 14 in, in width sout to particular iongths; add 20 * B. **MOTION OF THE MARKET METAL AND WIRE. **MOTION OF THE METAL AND WIRE. **MOTI	Paints, Oils, &c.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween; in width 14 in. to % in. to hanner than No. 38, 50 ** b advance. **Metal in width 14 in. to %; inclusive, not thinner than No. 28, 20 ** b advance. **Metal: In width 14 in. to %; thinner than No. 38, 40 ** a dvance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width and less, 100 ** b advance. **Metal: 14 in. in width sout to particular iongths; add 20 ** b. **Merket Metal: Wire 1 see oent., 12 inch to No. 36	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween, in width 1st. to \$\forall \text{in thinner than No. 38, \$\forall \text{\$\text{\$m\$}}\$ and \text{\$v\$} and \text{\$m\$}. \text{\$m\$}	Paints, Oils, &c. Black Lamp, Coach Painters. Black Lamp, Ordinary. Black Ivory Drop, fair. Black Ivory Drop, fair. Black Paint, in oil. Black Paint, in oil. Blue Prusalan, fair to best.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \(\) in telluner than No. \(\) is, \(\) is playance. Mekal in width \(\) in. to \(\) in inclusive, not thinner than No. \(\) \(\) is a very badvance. Mo. \(\) \(\) \(2 \) very badvance. Motal in width \(\) in. to \(\) is thinner than No. \(\) \(\) is, \(\) is Particular in width in the land less, to \(\) \(\) badvance. Any of the above widths cut to particular lengths; add To \(\) is the above widths cut to particular lengths; add To \(\) B. Market Metal. Wire. BERMAN SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. GETHAL SILVER MARKET METAL AND WIRE. See than 10 Mo. \(\) \(\) is the see to \(\)	Paints, Oils, &c. Black Lamp, Coach Painters.
ween, in width 1st. to \$5 in. tellamer than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in. width 1st and less, 1co F advance. **Metal in. width and in. width and wighing neare than 1co. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. Market Metal. German Silver Turnings. Filings 1s in. width and the price of Scrap. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width 2co. **Metal in. width 1s in. width 1s in. width and 2co. **Metal in. width 1s in. w	Paints, Oils, &c. Black Lamp, Coach Paintes. Black Lamp, Ordinary. Black Ivory Drop, fair. 12 @ 14c Black Ivory Drop, fair. 12 @ 14c Black Paint, in oil. Black Paint, in oil. Black Paint, in oil. Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Brown, Van Dyke. Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 60 Green, Chrome. 7 @ 60 Green, Chrome. 8 . 60 Green,
ween, in width 1st. to \$5 in. tellamer than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in. width 1st and less, 1co F advance. **Metal in. width and in. width and wighing neare than 1co. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. Market Metal. German Silver Turnings. Filings 1s in. width and the price of Scrap. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width 2co. **Metal in. width 1s in. width 1s in. width and 2co. **Metal in. width 1s in. w	Paints, Oils, &c. Black Lamp, Coach Paintes. Black Lamp, Ordinary. Black Ivory Drop, fair. 12 @ 14c Black Ivory Drop, fair. 12 @ 14c Black Paint, in oil. Black Paint, in oil. Black Paint, in oil. Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Brown, Van Dyke. Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 60 Green, Chrome. 7 @ 60 Green, Chrome. 8 . 60 Green,
ween, in width 1st. to \$5 in. tellamer than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in. width 1st and less, 1co F advance. **Metal in. width and in. width and wighing neare than 1co. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. Market Metal. German Silver Turnings. Filings 1s in. width and the price of Scrap. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width 2co. **Metal in. width 1s in. width 1s in. width and 2co. **Metal in. width 1s in. w	Paints, Oils, &c. Black Lamp, Coach Paintes. Black Lamp, Ordinary. Black Ivory Drop, fair. 12 @ 14c Black Ivory Drop, fair. 12 @ 14c Black Paint, in oil. Black Paint, in oil. Black Paint, in oil. Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Brown, Van Dyke. Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 60 Green, Chrome. 7 @ 60 Green, Chrome. 8 . 60 Green,
ween, in width 1st. to \$5 in. tellamer than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in. width 1st and less, 1co F advance. **Metal in. width and in. width and wighing neare than 1co. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. Market Metal. German Silver Turnings. Filings 1s in. width and the price of Scrap. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width 2co. **Metal in. width 1s in. width 1s in. width and 2co. **Metal in. width 1s in. w	Paints, Oils, &c. Black Lamp, Coach Paintes. Black Lamp, Ordinary. Black Ivory Drop, fair. 12 @ 14c Black Ivory Drop, fair. 12 @ 14c Black Paint, in oil. Black Paint, in oil. Black Paint, in oil. Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 45 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Blue Prussian, fair to best, in oil. 46 @ 50 Brown, Van Dyke. Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 50 Green, Chrome. 6 @ 60 Green, Chrome. 7 @ 60 Green, Chrome. 8 . 60 Green,
ween, in width 1st. to \$5 in. tellamer than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in width 1st in. to \$5 thinner than No. 38, 50 F advance. **Metal in. width 1st and less, 1co F advance. **Metal in. width and in. width and wighing neare than 1co. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. width above 1s in. and 2c. F a on each No. thinner than No. 3co to 2 in. Market Metal. German Silver Turnings. Filings 1s in. width and the price of Scrap. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width and price of 2co. **Metal in. width 1s in. width 2co. **Metal in. width 1s in. width 1s in. width and 2co. **Metal in. width 1s in. w	Paints, Oils, &c. Black Lamp, Coach Painters.

Dryer,s Patent Am'h		. asa't	cana.	oc: ke							
FTOSLIDES				86							
Glue, White. Glue, Sheet.				24 @ 35							
Glue, Sheet				30							
Glaziers, Loints, Tine											
Gum, Copal	*******	*** ****		. 90							
Cum Shelles Paglish				25							
Gum Shollac English deal	*******										
Litharen				34							
Gum, Copal Gum Shellac, English Gum Shellac, English Gum Shellac, English dari Litharge Pumice Stone, selected Lu Pumice Stone, Powdered Pine Tax. biris.	mma										
Punice Stone, Powdered	mpa			286							
Pine Tar, bibis			*******								
Pltch				82.0							
Putty in bladders				- 100							
Putty, in bulk Rosin-Common and Good				356							
Rosin-Common and Good	-Strali	ned		BL.9							
G & H I & K			82.90	68 \$2.5							
M & N			83.00	(d) \$2.8							
Spirits Turpentine		******		2 60, 420							
Whiting Spanish				Box							
Waste, No. 1 Cop Waste, No. 1 White Machine				300							
Waste, No. 1 White Machine	0			300							
Waste, No. 2 White Machine				9160							
Waste, No. 1 Colored				7							
Waste, No. 2 White Machine Waste, No. 1 Colored Waste, No. 2 Colored Waste, No. 2 Colored Waste, Washed Machine				614							
waste, washed machine	*******										
6310	LEER.										
Prices ourrent pe	r box	of 50 fe	ref.								
List, Janua	LPY 17, 1	1882.									
	Thick.		Single Thick.								
SIZES.	ISE.	2dL	3d.	4th.							
			-	-							
6 x 8 to 10 x 15	\$10.00	8 9.25	8 9.00	8 8.9							
6 x 8 to 10 x 15 1 x 14 to 16 x 24	\$10.60 11.50	\$ 9.25 30.75	8 q.00 10.25	8 8.9							
6 x 8 to 10 x 15 11 x 14 to 16 x 24	\$10.60 11.50	\$ 9.25 20.75 13.75	8 9.00 10.25 12.50	8 8.9							
6 x 8 to 10 x 15 1 x 14 to 16 x 24	\$10.60 11.50	\$ 9.25 20.75 13.75	\$ 0.00 10.25 12.50 13.00 14.00	8 8.9							
6 X 8 to 10 X 15	\$10.00 11.50 14.75 10.50 17.50 18.75	\$ 9.25 20.75 13.75 14.75 16.00 17.25	\$ 0.00 10.25 12.50 13.00 14.00	8 8.9							
6 x 8 to 10 x 15	\$10.00 11.50 14.75 10.50 17.50 18.75	\$ 9.25 10.75 13.75 14.75 10.00	8 9.00 10.25 12.50 13.00	8 8.9							
6 x 8 to 10 x 15	\$10.60 11.50 14.75 10.50 17.50 18.73 20.50	\$ 9.25 10.75 13.75 14.75 10.00 17.25 19.25 21.00	\$ 9.00 10.25 12.50 13.00 14.00 14.50 16.50 26.00	8 8.9							
6 x 8 to 10 x 15 11 x 14 to 16 x 24 12 x 14 to 16 x 24 13 x 24 to 19 ex x 50 14 x 36 to 24 x 30 15 x 24 to 14 x 36 16 x 36 to 12 x 24 16 x 36 to 26 x 24 16 x 36 to 30 x 50 17 x 24 to 30 x 54	\$10.60 11.50 14.75 16.50 17.50 18.75 20.50 22.75 24.00	8 9.25 10.75 13.75 14.75 10.00 17.25 19.25 21.00 27.00	8 0.00 10.25 12.50 13.00 14.00 14.50 16.50 26.00 19.75	8 8.9							
6 x 8 to 10 x 15 1 x 14 to 16 x 24 2 x 24 to 30 x 25 3 x 36 to 24 x 30 4 x 36 to 24 x 30 6 x 36 to 30 x 44 6 x 36 to 30 x 44 6 x 36 to 30 x 54 0 x 50 to 34 x 5 0 x 50 to 34 x 5	\$10.60 11.50 14.75 10.50 17.50 18.75 20.50 22.75 24.00 25.25	8 9.25 10.75 13.75 14.75 16.00 17.25 19.25 21.00 27.00 25.75	\$ 9.00 10.25 12.50 13.00 14.00 14.50 16.50 96.00 89.75 21.50	8 8.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 25 to 20 x 29. 2 x 36 to 24 x 30. 6 x 26 to 24 x 30. 6 x 26 to 26 x 44. 6 x 36 to 30 x 50. 0 x 4 to 30 x 50. 0 x 4 to 30 x 50. 0 x 4 to 30 x 50.	\$10.60 11.50 14.75 10.50 17.50 18.75 20.50 22.75 24.00 25.25 28.60	8 9.25 10.75 13.75 14.75 10.00 17.25 19.25 21.00 27.00	8 0.00 10.25 12.50 13.00 14.00 14.50 16.50 26.00 19.75	8 8.9							
6 x 8 to 10 x 15 1 x 14 to 16 x 24 2 x 24 to 30 x 25 3 x 36 to 24 x 30 4 x 36 to 24 x 30 6 x 36 to 30 x 44 6 x 36 to 30 x 44 6 x 36 to 30 x 54 0 x 50 to 34 x 5 0 x 50 to 34 x 5	\$10.60 11.50 14.75 10.50 17.50 18.75 20.50 22.75 24.00 25.25 28.60	8 9.25 10.75 13.75 14.75 16.00 17.25 19.25 21.00 27.00 25.75	\$ 9.00 10.25 12.50 13.00 14.00 14.50 16.50 96.00 89.75 21.50	8 8.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 25 to 20 x 29. 2 x 36 to 24 x 30. 6 x 26 to 24 x 30. 6 x 26 to 26 x 44. 6 x 36 to 30 x 50. 0 x 4 to 30 x 50. 0 x 4 to 30 x 50. 0 x 4 to 30 x 50.	\$10.60 11.50 14.75 10.50 17.50 18.75 20.50 22.75 24.00 25.25 28.60	8 9.25 10.75 13.75 14.75 16.00 17.25 19.25 21.00 27.00 25.75	\$ 9.00 10.25 12.50 13.00 14.00 14.50 16.50 96.00 89.75 21.50	8 8.9							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 8 x 22 to 9 ex x 90. 1 x 36 to 24 x 39. 1 x 36 to 24 x 39. 1 x 36 to 30 x 44. 1 x 36 to 30 x 50. 2 x 36 to 30 x 50. 3 x 36 to 30 x 50.	\$10.60 11.50 14.75 10.50 17.50 18.75 18.75 24.00 22.75 24.00 25.25 26.60 Thick.	\$ 9.25 10.75 13.75 14.75 16.00 17.25 19.25 21.00 27.00 22.05 20.00	\$ 0.00 10.25 12.50 13.00 14.50 14.50 16.50 26.00 80.75 21.50 23.75	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 3 x 24 to 20 x 30. 5 x 36 to 24 x 30. 6 x 36 to 36 x 44. 6 x 46 to 30 x 50. 0 x 50 to 36 x 44. 2 x 50 to 36 x 54. 0 x 50 to 36 x 56. Double	\$10.00 11.50 14.75 10.50 17.50 18.75 20.50 22.75 24.00 25.25 26.60 Thick.	\$ 9.25 10.75 13.75 14.75 10.00 17.25 19.25 27.00 27.00 25.75 20.00	\$ 0.00 10.25 12.50 13.00 14.00 15.50 16.50 16.50 26.00 39.75 21.59 23.76	\$ 5.9 9.9 11.9							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 13 x 24 to 20 x 30. 14 x 36 to 24 x 30. 15 x 36 to 24 x 30. 16 x 36 to 26 x 34. 16 x 36 to 30 x 50. 10 x 36 to 36 x 46. 10 x 36 to 36 x 50. 10 x 36 to 10 x 15. 11 x 14 to 16 x 24.	\$10.00 11.50 11.75 10.50 17.50 18.75 20.50 82.75 24.00 25.25 26.50 Thick. 18t.	\$ 9.25 10.75 13.75 14.75 10.00 17.25 19.25 27.00 27.00 25.75 20.00	\$ 0.00 10.25 12.50 13.60 14.50 16.50 26.00 39.75 21.59 23.75	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 24 x 30. 6 x 26 to 24 x 30. 6 x 36 to 30 x 44. 6 x 46 to 30 x 50. 0 x 5 to 30 x 50. 0 x 5 to 30 x 50. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24.	\$10.00 11.50 14.75 15.50 17.50 18.75 20.50 22.75 24.00 25.25 28.60 18.75 24.00 15.75 26.00	\$ 0.25 20.75 13.75 14.75 10.00 17.25 21.00 22.00 25.75 26.00 20.00	\$ 0.00 10.25 12.50 13.60 14.60 16.50 16.50 16.75 21.56 23.75 3d.	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 24 x 30. 6 x 36 to 24 x 30. 6 x 36 to 26 x 44. 6 x 36 to 30 x 50. 0 x 42 to 30 x 50. 0 x 45 to 34 x 56. 1 x 36 to 34 x 56. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30.	\$10.00 11.50 11.75 15.50 17.50 17.50 20.50 22.75 24.00 25.25 26.60 Thick. 18t. \$13.00 15.75 20.00 22.00	\$ 0.25 10.75 13.75 14.75 10.00 17.25 19.25 21.00 2.00 25.75 20.00	\$ 0.00 10.25 12.50 13.60 14.50 16.50 16.50 21.59 21.59 23.75 \$11.75 14.00 17.09 27.75	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 24 x 30. 5 x 36 to 24 x 30. 6 x 36 to 24 x 36. 6 x 36 to 25 x 44. 6 x 46 to 25 x 44. 6 x 46 to 25 x 54. 6 x 56 to 26 x 56. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 26 to 20 x 30. 5 x 26 to 24 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.60 Thiek. 18t.	\$ 0.25 10.75 13.75 14.75 10.00 17.25 21.00 27.00 22.00 20.00	\$ 0.00 10.25 12.50 13.00 14.50 14.50 15.50 28.00 39.75 21.59 23.75 3d. \$11.75 14.00 17.00 27.75 19.25	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 24 x 30. 5 x 36 to 24 x 30. 6 x 36 to 24 x 36. 6 x 36 to 25 x 44. 6 x 46 to 25 x 44. 6 x 46 to 25 x 54. 6 x 56 to 26 x 56. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 26 to 20 x 30. 5 x 26 to 24 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.60 Thiek. 18t.	\$ 0.25 10.75 13.75 14.75 10.00 17.25 10.00 27.00 25.75 20.00 20.00 21.25 14.75 18.50 20.00 22.50	\$ 0.00 10.25 12.50 13.60 14.60 14.50 16.50 26.00 19.75 21.59 23.75 \$11.75 14.00 17.09 17.09 27.75 14.00	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 3 x 24 to 20 x 30. 5 x 36 to 24 x 36. 6 x 36 to 26 x 34 x 36. 6 x 36 to 30 x 44. 6 x 46 to 30 x 50. 6 x 36 to 36 x 5. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 20 x 30. 5 x 36 to 20 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.60 Thiek. 18t.	\$ 0.25 10.75 13.75 14.75 10.00 17.25 10.25 21.00 2.00 20.00	\$ 0.00 10.25 12.50 13.60 14.50 16.50 96.00 89.75 21.59 23.75 811.75 14.00 17.79 19.25 20.00 22.00	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 3 x 24 to 20 x 30. 5 x 36 to 24 x 36. 6 x 36 to 26 x 34 x 36. 6 x 36 to 30 x 44. 6 x 46 to 30 x 50. 6 x 36 to 36 x 5. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 20 x 30. 5 x 36 to 20 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.60 Thiek. 18t.	\$ 9.25 10.75 13.75 14.75 14.75 16.00 17.25 110.00 21.00 22.57 20.00 24.00 812.25 14.75 18.50 20.00 22.50 22.50 23.50 24.25 24.25 25.25 26.20	\$ 9.00 10.24 12.40 14.90 14.90 14.90 16.50 18.00 19.74 21.59 23.75 3d. \$11.75 14.00 17.00 17.00 17.75 19.23 20.00 22.00 24.00	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 3 x 24 to 20 x 30. 5 x 36 to 24 x 36. 6 x 36 to 26 x 34 x 36. 6 x 36 to 30 x 44. 6 x 46 to 30 x 50. 6 x 36 to 36 x 5. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 20 x 30. 5 x 36 to 20 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.40 Thiek. 18t.	\$ 9.25 10.75 13.75 14.75 16.00 17.25 19.25 29.00 2.00 2.00 2.575 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 2	\$ 0.00 10.25 12.50 13.50 14.50 16.50 16.50 16.50 16.75 21.50 23.75 21.50 21.75 14.00 17.75 19.25 20.00 22.00 24.60	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 3 x 24 to 20 x 30. 5 x 36 to 24 x 36. 6 x 36 to 26 x 34 x 36. 6 x 36 to 30 x 44. 6 x 46 to 30 x 50. 6 x 36 to 36 x 5. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 20 x 30. 5 x 36 to 20 x 30.	#10.00 11.50 14.75 10.50 17.50 18.75 20.50 25.27 24.00 25.25 28.40 Thiek. 18t.	\$ 9.25 10.75 13.75 14.75 14.75 16.00 17.25 110.00 21.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 22.50 20.00 23.50 24.50 25.50 26.5	\$ 9.00 10.24 12.40 14.90 14.90 14.90 16.50 18.00 19.74 21.59 23.75 3d. \$11.75 14.00 17.00 17.00 17.75 19.23 20.00 22.00 24.00	8 8.9 9.9 11.9							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 8 x 24 to 20 x 30. 2 x 36 to 24 x 36. 3 x 36 to 26 x 34 x 36. 3 x 36 to 26 x 34 x 36. 3 x 36 to 26 x 34 x 36. 3 x 36 to 26 x 34 x 5. 4 x 36 to 30 x 50. Double SIZES. 5 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 30. 5 x 36 to 20 x 30.	\$10.00 11.50 11.75 11.50 17.50 18.75 20.50 22.75 24.00 25.25 26.60 15.75 20.00 22.00 24.00 24.00 25.00 27.00	\$ 9.25 10.75 13.75 14.75 16.00 17.25 91.00 22.00 22.00 20.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	# 8.9 9.9 11.9							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 13 x 14 to 16 x 24. 14 x 26 to 26 x 30. 15 x 26 to 24 x 30. 15 x 26 to 26 x 34. 16 x 36 to 26 x 36. 18 x 36 to 36 x 5. 18 x 14 to 16 x 24. 18 x 26 to 36 x 36. 18 x 36 to 3	\$10.00 11.50 11.75 11.50 17.50 18.75 20.50 22.75 24.00 25.25 26.60 15.75 20.00 22.00 24.00 24.00 25.00 27.00	\$ 9.25 10.75 13.75 14.75 16.00 17.25 91.00 22.00 22.00 20.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	8 8.qq qqq xLqq							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 13 x 14 to 16 x 24. 14 x 26 to 26 x 30. 15 x 26 to 24 x 30. 15 x 26 to 26 x 34. 16 x 36 to 26 x 36. 18 x 36 to 36 x 5. 18 x 14 to 16 x 24. 18 x 26 to 36 x 36. 18 x 36 to 3	\$10.00 11.50 11.75 11.50 17.50 18.75 20.50 22.75 24.00 25.25 26.60 15.75 20.00 22.00 24.00 24.00 25.00 27.00	\$ 9.25 10.75 13.75 14.75 16.00 17.25 91.00 22.00 22.00 20.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	8 8.qq qqq xLqq							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 13 x 14 to 16 x 24. 14 x 26 to 26 x 30. 15 x 26 to 24 x 30. 15 x 26 to 26 x 34. 16 x 36 to 26 x 36. 18 x 36 to 36 x 5. 18 x 14 to 16 x 24. 18 x 26 to 36 x 36. 18 x 36 to 3	\$10.00 11.50 11.75 11.50 17.50 18.75 20.50 22.75 24.00 25.25 26.60 15.75 20.00 22.00 24.00 24.00 25.00 27.00	\$ 9.25 10.75 13.75 14.75 16.00 17.25 91.00 22.00 22.00 20.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	8 8.qq qqq xLqq							
6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 2 x 14 to 16 x 24. 8 x 22 to 20 x 30. 2 x 36 to 24 x 36. 6 x 36 to 20 x 44. 6 x 36 to 20 x 45. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 24. 8 x 22 to 20 x 24. 6 x 36 to 24 x 36. Double SIZES. 6 x 8 to 10 x 15. 1 x 14 to 16 x 24. 8 x 22 to 20 x 24. 6 x 36 to 24 x 36. 6 x 36 to 26 x 34. 8 x 35 to 26 x 36. 8 x 35 to 26 x 36	\$10.00 11.50 11.50 11.50 12.75 20.90 22.75 24.00 25.25 26.00 15.75 20.00 22.00 24.00 24.00 24.00 25.00 27.00 24.00 24.00 25.00 2	\$ 0.25 10.75 13.75 14.75 16.00 17.26 19.25 27.00 25.00 25.00 25.00 20.00 22.50 20.00 22.50 23.50 23.50 23.50 24.00 24.00 24.00 25.50 26.00 27.50 28.00 27.50 28.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	8 8.qq qqq xLqq							
6 x 8 to 10 x 15. 11 x 14 to 16 x 24. 12 x 14 to 16 x 24. 13 x 14 to 16 x 24. 14 x 36 to 24 x 30. 15 x 36 to 24 x 30. 15 x 36 to 24 x 30. 15 x 36 to 30 x 34. 15 x 36 to 30 x 34. 16 x 36 to 30 x 36. 18 x 36 to 30 x 56. 18 x 16 to 30 x 56. 18 x 16 to 30 x 56. 18 x 16 to 16 x 15. 11 x 14 to 16 x 24. 18 x 24 to 30 x 30. 15 x 36 to 34 x 30. 16 x 36 to 30 x 30. 17 x 14 to 16 x 36. 18 x 16 to 30 x 30. 18 x 16 x 36 to 30	\$10.00 11.50 11.50 11.50 12.75 20.90 22.75 24.00 25.25 26.00 15.75 20.00 22.00 24.00 24.00 24.00 25.00 27.00 24.00 24.00 25.00 2	\$ 0.25 10.75 13.75 14.75 16.00 17.26 19.25 27.00 25.00 25.00 25.00 20.00 22.50 20.00 22.50 23.50 23.50 23.50 24.00 24.00 24.00 25.50 26.00 27.50 28.00 27.50 28.00	\$ 0.00 10.25 12.50 13.00 14.50 16.50 16.50 16.50 16.75 21.79 23.75 21.70 17.00 17.75 14.00 17.75 19.25 20.00 24.00 26.00	8 8.qq qqq xLqq							



R. T. WHELPLEY, 131 & 133 Lake Street. CHICAGO, ILI



INTERCHANGRABLE LOCK-CORNER SHELF BOXES FOR THE HARDWARE TRADE S. H. GREEN





FINE FASTE ENGRAVING

HERMANN BOKER & CO.,

- VISE & TOOL WORKS. PROPRIETORS OF PICKS, MATTOCKS, CRUB HOES, HAMMERS. WROUGHT IRON STEEL FACE (P. W. PATTERN.) **FULLY WARRANTED."**

Sole Agents for H. Boker & Co.'s Celebrated '' Tree'' Brand Cutlery. ers, Scissors, Japanned and Nickeled, Gardner's 1881 Hazors. R Heinisch's Sons Unrivaled Shears, Trimm

J. W. Gardner's Unequaled and "Warranted Superior to All" Barlows, Pocket and Table Cutlery. Geo. Wostenholm & Son's, Wade & Butcher's, Trenton, and O. K. Pocket Cutlery

and Razors.

Jno. Wilson's Butcher Knives, Steels and Shoe Knives, New England Cutlery Co.'s Table Cutlery, W. Butcher's Files and Tools. Guns and Pistols, Arms and Ammunition.

THE DEAN LEMON SQUEEZERS. Nos. 1, 2 and 3, Patented Feb. 7, 1882.





They Have Double the Power of any Other Squeezer.
50,000 SOLD FIRST YEAR. THEY GIVE PERFECT SATISFACTION Send for Price List.

WM. B. DEAN, 43 Murray St., New York, SOLE PROPRIETOR.

LOUDERBACK'S NEW AND PERFECT ADJUSTABLE OR STATIONARY.



Extends or opens 5 inches in width and will fit any window.

Patented December 12, 1882.

Edwin Louderback & Co., MANUFACTURERS,

413 and 415 S. 5th Street, Philadelphia, Pa. Liberal Discounts to the Trade. Send for Price List.

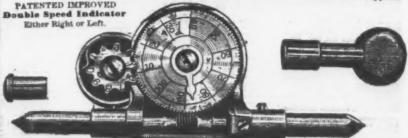


CC Malleable and Gray Iron, All Kinds. STAR MACHINE WORKS, Cleveland, O.

Stubs' Files, Tools and Steel, Grobet Swiss Files. CHESTERMAN'S MEASURES.

Hubert's French Emery Paper, Morseshoe Magnets, &c. WM. SMITH & SON'S CELEBRATED MUSIC WIRE, Nos. 2 to 30 French Sheet Steel, 3 1-4 in. wide, from 4 to 65 thousandths.

Machinista', Silversmitha', Jewelers', Die Sinkers' and Sewing Machine Manufacturers' Supplies PATENTED IMPROVED Either Right or Left.



GEO. W. MOSTGOMERY, GEO. W. CHURCH,

105 Fulton St., NEW YORK

RHODE ISLAND TOOL CO.

PROVIDENCE TOOL CO.,

Machinery Nuts (Square and Hexagon), CHAMFERED AND TRIMMED WITH DRILLED HOLES.

Finished Case-Hardened Hexagon Nuts, and Squared and Tapped Hexagon Nuts. U. S. GOVERNMENT STANDARD THREADS.



WARRANTED INTERCHANGEABLE.



OTHER ARTICLES OF THEIR MANUFACTURE ARE Turn Buckles, Clinch Rings, Bolt Ends, Norcross Patent Iron Blocks and Chain Links. Small Drop Forgings made to Order. PROVIDENCE, R. I.

AGENCIES:

Henry B. Newhall Co., - - - No. 105 Chambers Street, New York, and No. 47 Pearl Street, Boston, Mass. (J. H. Work, Manager). H. & E. Y. Moore, Nos. 163 and 165 Lake Street, Chicago, Ill.



GREATEST ROCK BREAKER ON EARTH.

CAPACITY & TON A MINUTE. DON'T FORGET IT

SEND FOR CIRCULARS, Ingines, Boilers, Stamp Mills and Mining Machinery.

GATES IRON WORKS,

52 Canal St., Chicago.

THE

AMERICAN DYNAMO-ELECTRIC MACHINE.

For Electro-Plating. Electrotyping, &c.

Requires no Water. Combining



Latest Improvements.

Cannot Reverse Current,

The Zucker & Levett Chemical Co.,

GENERAL AGENTS,

Manufacturers and Importers of NICKEL PLATERS' SUPPLIES.

540, 542, 544 & 546 WEST 16TH STREET, N. Y.

TO THE

TRADE.

(Registered Trade Mark, Oct. 8, ${}^{1}\!\!/3,$ No. 6,704, and May 31, ${}^{1}\!\!81,$ No. 8,308.)



PATENTED :

Dec. 2, 2373, No. 245, 103. Aug. 27, 1872, No. 130,833. Aug. 25, 1874, No. 154,460. Nov. 20, 1874, No. 156,669. May 7, 1878, No. 203, 272.

HILL

H. W HILL, C. P. HOUSUM.

DECATUR, ILL.

THE U.S. IRON & TIN PLATE COMPANY, Limited, Demmler P. O., Allegheny Co., Pa.,

U. S. A. M. and J. H. brands of Cold Rolled and Polished SHEET IRON AND SHEET STEEL.

John T. Lewis & Bros. No. 231 South Front St. PRILADF LPHIA.



MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil, AND PAINTERS' COLORS

JOHN JEWETT & SONS Manufacturers of the well-known brand of WHITE LEAD.



LINSEED OIL. 181 Front Street, NEW YORK



The Atlantic White Lead and Linseed Oil Co.,

Manufacturers of White Lead (Atlantic), Red Lead, Litb arge, Glass Makers' Lithage and Orange Mineral;

LINSEED OIL Raw, Refined and Boiled. ROBERT COLCATE & CO.

987 Pearl St., NEW YORK SALEM LEAD COMPANY



Lead Pipe and Narrow Sheet Lead F. A. BROWN, Treas. NALEM, MANS.

WITHEROW & GORDON, **Engineers & Contractors** PITTSBURGH, PA.

Agents for the

WHITWELL HOT BLAST STOVES

OVER 600 IN USE.

der construction.

Sedar Point Iron Co., N. Y.

Dunbar Furnace Co., Pa.

Crans Iron Co., Pa.

Crans Iron Co., Pa.

Sen Sangott Iron, Pa.

Parton Purnaces, Pa.

Sen Sangott Iron, Pa.

Eina Iron Works, Ohio.

Miton Coal and Iron Co., Ohio.

Winona Furnace Co., Ohio. H. Campbell & S. ns. Ohio. Hocking Valley Iron Co., Ohio. Cleveland Rolling Mill Co., Ohio. Hele Iron Co., Ill. North Chicago Steel Co., Ill. North Chicago Steel Co., Ill. North Chicago Steel Co., Ill. Heans & Culbertson, Ky. Ashland Furnace Co., Ey. Norton Iron Co., Ky. Southern Stated C., I. and S. Co., Tenp. Sewanec Furnace Co., Tenp. Junes C. Warner, Rising Fawa, Gz., Ohio Issa Co., Zanasyllie, C., Siges Furnace Co., Ash.

CROTON

McCOLLUM MINES. THEALL MINES. BREWSTERS, Putnam Co., N. Y

AVERAGE ANALYSIS.
 Per-oxide Iron
 50.59
 Silica
 15.70

 Protoxide Iron
 23.02
 Carbonic Acid
 37

 Protoxide Manganese
 32
 Phosphoric Acid
 37

 Titanic Acid
 37
 Titanic Acid
 37

 Alumina
 3.27
 Titanic Acid.
 —

 Maguesia
 .76
 Sulphur.
 .58

 Lime
 I.65
 Soda
 —

 Wester for
 Wester for
 Water, &c

THE CHOTON MAGNETIC IRON MINES are now ready to contract for next year's delivery of their superior Magnetic Iron Ores, delivered at Port Morris, New York City or on the line of New York and New England Railroad, Eric Railroad and connections. The ores are guaranteed to yield 50 % Metallic Iron.

W. E. RIDER, Genl. Manager. Brewsters, Putnam Co., N. Y.

OFFICE, 29 PARK ROW, N. Y. City. P. O. Box 2180.

JOHN H. CHEEVER Pres. J. D. CHEEVER, Treas.

HANSON, VAN WINKLE & CO., Sole Agents for

Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.

For Nickel, B.onze, Brass, Copper and Silver Plating. Over 1000 machines in use. Are used by all leading stove

nanufacturers,
Experienced men sent to put
up machines and instruct purwe call attention to infringe we call attention to infringe tents of the Weston Machin which Automatic Switcher

MANUFACTURERS OF Cast Nickel Anodes, Pure Nickel Salts, Polishing Materials.

New York Office, 92 & 94 Liberty St. Manufactory, Newark, N. J.

BRASS, MALL. IRON AND SCANDINAVIAN PADLOCKS,

Manufactured by JOHN J. TOWER, 96 Chambers St., New York. BEST QUALITY. LARGE VARIETY.











GEO. M. SCOTT, Bellows Manufacturer, Johnson Street, Cor. 12d St., CHICAGO, ILL.

C. F. HARRISON, BOILER, BRIDGE & TANK

ENAMEL PAINT CO., PAWTUCKET MFG. CO., PAWTUCKET, R. I.

STEEL

MADE



132 & 134 River Street, CLEVELAND OHIO.

A. F. PIKE,
Pike Station,
Manufacturer and Wholesale Dealer in Bluestone
For Scythes, Ages, Halves and Turpenties Hacks
Factories as Fite Station, N. H.
and Evanythe & westnore, Vt.

and Evansville & Wes facultue Old Reli Indian Pend (Red E Premium, Union, Whie Mountain, Letolie, Hucker, 1 amond tirlt, The New Hoss Lamolite, Rasg, Willoughy Lake, Stones made le

MACHINE BOLTS OF ALL KINDS. dapted for Catton Woolen and other SPECIAL BOLTS. with ext a large head; for soft wood, leather rubber, or other yielding material.

BOLTS

TO ORDER.

Stud Bolts, Spring Bolts, Hook Bolts, Eye Bolts, &c. COLD PUNCHED NUTS, WASHERS, CHAIN LINKS.

Set and Cap Screws, Stirrup, Clearer Springs and Levers.



R. H. WOLFF & CO., STEEL WIRE FOR ALL PURPOSES.

Special Finest CAST STEEL WIRE. Market Steel Wire, Prime Coppered Spring Wire, Tempered and Untempered Steel Wires, in Long Lengths, for Crinoline, Corset, Lock and Brush Makers, and all Special Purposes. ALL KINDS OF FURNITURE SPRINGS.
IMPORTERS OF

IRON, STEEL, & RAILS of Every Description. Wire Rods, Plain and Galvanized Wires, &c., Gun Barrels, Moulds, and Ordnance.

Shipments in bond from American Ports, and direct from Europe to all parts of the World. EXPORTERS AND CENERAL MERCHANTS.

WORKS, PEEKSKILL, N. Y. Agents of the ALLIS PATENT STEEL BARBED FENCE



ADDRESS Office and Warehouse, 93 John Street, New York.

Pittsburgh, Pa., Manufacturers of

CRESCENT

In Bars, Sheets, Cold-Rolled Strips, &c.

Polished, Compressed Drill Rods and Wire,

Warranted equal to any imported in quality, finish and see Also Common Grades.

CELEBRATED " DOC BRAND"

WARRANTED ALL HAND-CUT FILES AND RASPS, PATENT

IN STRIPS, COILS AND SHEETS, AND FOR

SHAFTING, PISTON RODS, &c.

SOLE AGENTS FOR

BAYLISS' Celebrated Forges, Bellows and Tools. HENRY W. BELCHER, Agent, 30 Gold St., New York.

S. & C. WARDLOW,

Sheffleld, England,

Manufacturers of the Celebrated

Cast and Double Shear STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

> Warehouse, 95 John Street, New York. WILLIAM BROWN, Representative.

CLEVELAND ROLLING MILL CO. MANUFACTURERS OF

Bessemer Steel and Iron Rail and Fastenings, SPRING STEEL AND WIRE OF ALL KINDS,

Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and Siding of Siemens-Martin, Bessemer Stoel and Iron.

CLEVELAND, OHIO.

Western Agency, 91 Lake St., CHICAGO. New England Agency, 239 Franklin St., BOSTON.

N. D. PBATT, Agent.

JOHN WALES & CO., Agents. WALTER SCRANTON. E. P. KINGSBURY. W W. SCRANTON,

Sec'y and Treas. President.

RAILS & BILLETS

Works at Scranton, Pa. 56 Broadway. New York Office,

THE MIDVALE STEEL NICETOWN, PHILADELPHIA.

Best Warranted Cast Steel for Machinists' Tools.

Taps, Dies, Punches, Shear Blades, Chipping Chisels and Granite Rock Drills, Extra Mild Center Steel, special for Taps;

MACHINERY AND CAST SPRING STEEL HEAVY AND LIGHT FORGINGS. Warehouse, No. 12 North 5th St., Philadelphia.

Gautier Steel See Page 3.

LABELLE STEEL WORKS.

SMITH, CO., SUTTON

Also Springs, Axles, Rake Teeth, &c. OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, PITTSBURGH, PA. Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO., and 510 Market St. at Cleveland by CONDIT, WICK & CO., 143 Water St.

ALBANY & RENSSELAER IRON & STEEL CO., TROY, N. Y.,

MANUFACTURERS OF

BESSEMER STEEL RAILS.

FISH PLATES, BOLTS, NUTS, SPIKES, &C.

Machinery Steel, Merchant and Ship Iron.

CHESTER GRISWOLD, Vice-President, - 56 Broadway, New York City.

BOND, PARSONS & CO.,

224 So. 3d St., PHILADELPHIA 104 John St., NEW YORK. AMERICAN AND FOREIGN PIG IRON,

Spiegeleisen, Blooms, Ralls, Wire Rods, &c. TIN PLATES.

VIVIAN, YOUNGER & BOND, London & Birmingham.

FRANCIS HOBSON & SON.

97 John Street, NEW YORK.

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England. CHAS. HUGILL, Agent.

american

CLEVELAND CRUCIBLE STEEL CO.

REPRESENTED BY

TEMPLE & LOCKWOOD, 12 Platt Street, New York.

Warranted Superior to any Steel in the Market, either English or American, for every purpose. Combination Chrome Steel and Iron for



Chrome Steel Works Kent Avenue and Keap Street, BROOKLYN, E. D., N. Y.

Branch, S. D. KIMBARK, Agent.

N. E. cor. 5th & Main Streets.

Established 1781.

OBERHAUSEN, ON RUHR.

8500 men employed.

STEEL RAILS, STEEL BLOOMS, STEEL WIRE RODS. SPIEGELEISEN.

FERROMANGANESE UP TO 80 PER CENT.

GODEFFROY & CO., Sole Agents for the United States. 43 New Street NEW YORK.

CROWN STEEL. CASSIDY & CO., Mfrs., Pittsburgh, Pa.

WARRANTED EQUAL TO ANY PRODUCED.

Best refined Cast Steel, for Edge and Turning Tools, Taps, Dies, Drills Punches, Shear Knives, Cold Chisels and Machinists' Tools. Also Machinery Steel and Forgings,

HICKS & DICKEY, Gen'l Agents, 413 Commerce St. Philadelphia. Represented in New York by F. L. Frament & Co., 112 John Street. Represented in Boston by Bellows & Mansion, 77 Oliver Street. Bepresented in Atlanta, Ga., by Davenport, Johnson & Co.

ANDERSON, DU PUY (SUCCESSORS TO ANDERSON & CO.)

Manufacturers of all Descriptions of

Agricultural, Tool. Machinery,

Works and Office at Chartiers Station, P. & L. E. R. R., Branch Office, Cor. Ross & First Aves. PITTSBURGH, PA.

R. MUSHET'S Special Steel

LATHES, PLANERS, &c.

SAMUEL OSBORN & CO., Sheffield, England. ented in the United States by

B. M. JONES & CO., Nos. 11 & 13 Oliver Street, BOSTON.

NAYLOR & CO.,

99 John St., New York. 6 Oliver St., Boston, Mass. 208 S. Fourth St., Philadelphia, Pa. IMPORTERS OF

STEEL AND IRON RAILS. Tin and Terne Plates, Swedish and Norway Iron,

BESSEMER STEEL WIRE RODS. Pig Iron, Spiegeleisen, Ferrom genese, Borap Steel and Old Iron Rails.

MANUFACTURERS OF STEEL COMPRESSED SHAFTING,

Benzon" Homogeneous Plates For Boilers, Fire-boxes, &c. Axles, Crank Pins, Spring Steel,

Martin-Siemens Steel and Iron For Railroad purposes.

And all other kinds of



BOLT & RIVET CLIPPERS.

For cutting off the ends of Bolts and Rivets, on carriages, wagons, harness, etc. Ask for them where you buy your hardware, or send for cir-lar and price list. CHAMBERS, BROTHER & CO., 52d St., below Laneaster Ave., Philadelphia, Pa.

THE VERONA TOOL WORKS. METCALF, PAUL & CO.,

Selid Steel Mining and Railroad Picks, Blacksmith's Sledges, Striking Hammers, Woodchopper's Wedges and Sledges, Mining, Quarry and Railroad Tools of the best ma terial and workmanship only. All tools are stamped with our name and trade mark, and fully warranted

Pitteburgh, Pa., CHICAGO, ILL. .

"MOSS" &

"MOSS-GAMBLE'S"

Office and Warehouse 80 JOHN ST., - - New York.



Eevin Bros. Mfg. Ce., asthampion, Ot.

Manufacturers of SLEIGH BELLS. House, Tea, Hand, Gong Bells, &c. Bell Metal Kettles

A. PARDEE, Hazleton, Pa. J. G. FELL, Phila.

237 South Third Street, PHILADELPHIA.

No. 111 Broadway, New York, MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.:

HAZLETON. A. Pardee & Co. CRANBURY, SUGAR LOAF. Pardee, Bro. & Co. LATTIMER. Calvin Pardee & Co. HOLLYWOOD. Pardee, Sons & Co. MT. PLEASANT.

RUB STO And CIRCUI J. E. QI

CO

Polishes a

Ingots,

Office, No.

Porcelain, Mir

Sand for Pric

BROS. & CO.,

PITTSBURGH, PA.

EDGAR THOMSON STEEL WORKS DEPARTMENT

Works at Bessemer Station, P. R. R.

Branch Office and P. O. Address, 48 Fifth Ave., MANUFACTURERS OF



OF SUPERIOR QUALITY.

Union Iron Mills Department

Mills at Thirty-third St. and A. V. R. R.

Branch Office and P. O. Address, Thirty-third St. MANUFACTURERS OF

STRUCTURAL IRON.

Bridge Iron, Iron Beams, Channel Bars, Car Truck Channels, Angles, Tees, Universal Mill Plates, Bar Iron, Light Steel and Iron Rails. Special attention given Unusual Shapes and Sizes.

Lithographs of sections and book of detailed information giving calculation of strain, &c., furnished Engineers and Architects on application.

NEW YORK OFFICE: Room 32, No. 55 Broadway, N. Y.

THE MONTOUR IRON & STEEL COMPANY

WORKS AT DANVILLE, PA. PIG IRON, T AND STREET RAILS, ___

A general assortment of mine and narrow gauge rails kept on hand from which shipments can be W. E. C. COXE, President,

C. P. LELAND, Pres't. THE CLEVELAND CRUCIBLE STEEL CO., E. M. GRANT, Gen'I Mgr.

TOOL, MACHINERY,

FILE AND SPRING.

CLEVELAND,

OHIO. BOSTON, JAS. J. KELLY, 28 Kilby Street.

NEW YORK, TEMPLE & LOCKWOOD, 12 Platt Street.

ST. LOUIS, W. C. KENREDY, 312 North 2d Street.

PITTSBURGH BESSEMER (LIMITED),

LIGHT RAILS A SPECIALTY.

P. O. Address, 87 Wood Street, Pittsburgh, Pa.

THOS. FIRTH & SONS, Limited,

Crucible Cast Steel.

JERE. ABBOTT & CO., AGENTS AND IMPORTERS OF

SWEDISH IRON, 23 Cliff St., NEW YORK.

35 Oliver St., BOSTON.

M. D W. LOOMIS, Treasurer.

W. J. Lewis, Chairman.

MANUFACTURERS OF

OPEN-HEARTH STEEL.

Ingots, Blooms, Billets, Slabs, Spring, Tire, Rod, Agricultural and Other Steels. Correspondence in reference to special shapes, sizes and qualities specially selicited. Office, No. 173 Wood St., PITTSBURCH, PA. Works, Linden Station, B. & O. R. R.

LUNDBERG,

N. M. HOGLUND'S SONS & CO., OF STOCKHOLM,

38 KILBY STREET, BOSTON. ALBERT POTTS, Philadelphia Agent, 234 & 236 N. Front Street.

EMERY AND

CORUNDUM

Can be run in WATER, OIL or ACID

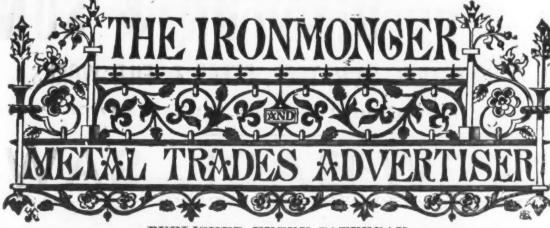
Polishes and Machinists' Supplies. RUB STONES, EMERY WHEEL MACHINERY
And DIAMOND TOOLS. CIRCULARS AND PRICE LISTS.

VITRIFIED WHEEL COMPANY, WESTFIELD, MASS., U. S. A.

J. E. QUACKENBUSH & SON Porcelain, Mineral & Jet Knobs & Escutcheons. Send for Price List OFFICE, and Terms 535 Sth Ave. N. Y.



ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES. OFFICE: 44a CANNON STREET, LONDON, E. C.

ADVERTISEMENTS AND SUBSCRIPTIONS ARE RECEIVED AT THE VARIOUS OFFICES OF "THE IRON AGE," NAMELY:

NEW YORK OFFICE: DAVID WILLIAMS, Publisher of The Iron Age, 83 Reade street, who will, on receipt of application, supply specimen copies free. PITTSBURCH OFFICE: 77 Fourth Avenue—JOS. D. WEEKS, CINCINNATI OFFICE: 55 West Fourth Street.

Manager and Associate Editor.

PHILADELPHIA OFFICE: 260 South Fourth Street—THOMAS

HOBSON, Manager.

CHICAGO OFFICE: 36 Clark Street, Cor. Lake Street—HENRY SMITH, Manager.

SPECIAL FEATURES.

Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.

Special Correspondents.—The Ironmonger has a deserved reputation for its special correspondence from all the principal Continental, Brigish and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the Ironmonger. The Weeks, Legal News, Trade Notes, Bankruptotes, Foreign Notes, Colonial Joittings. Mercants' Circulars, &c, are each departments of the journal containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes, French, Belgian and other Special Correspondence.

Subscriptions

to the Ironmonger and Metal Trades' Advertiser, with which is sent every fourth week the Foreign Supplement (see below), may commence from any date, but are not received for less than a year complete. The rate is \$5 per annum, inclusive of postage to any part of the world outside Great Britain. To every subscriber is presented, free, in the course of his year, a handsome and useful Ironmongers' Diary and Text Book, a work sold to non-subscribers \$1 75 cents.

By a mutual clubbing arrangement between the two journals, subscriptions to both will be received by either The Ironmonger or The Iron Age on the following terms:

THE IRONMONGER and THE IRON AGE, Weekly. In the United States and Canada

ADVERTISEMENTS

are inserted in the Ironmonger and Metal Trades' Advertiser at the subjoined rates, from which no variation can be made on any ground whatever.

Size of Page-Nine Inches Deep by Six Inches Wide.

One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in the Ironmongers' Diary and Text Book, published toward the end of each year, and presented to every Subscriber.

	53 INSERTIONS, each net.	27 INSERTIONS, each net.	13 INSERTIONS, each net.	7 INSERTIONS, each net.	3 INSERTIONS, each net.	I INSERTION net.
One page	\$20.00	\$22.50	\$25.00	\$30.00	\$35.00	\$50.00
Two-thirds page	15.00	16.90	18.75	22.50	26.25	37.50
Half page	11.00	12.40	13.75	16.50	19.25	27.50
One-third page	8.00	9.00	10.00	12.00	14.00	20.00
Quarter page	6.40	7.25	8.00	9.60	11.20	16.00
One-sixth page	4.50	5.10	5.65	6.75	7-75	11.30
One-eighth page	3.60	4.10	4.50	5.40	6:25	9.00
One-sixteenth page		2.25	3.50	3.00	3.50	5.00

In the spring and autumn of each year there is published a special issue, the circulation of which is not less than Twelve Thousand (12,000) copies.

THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, presented free to every Subscriber to the IRONMONGER AND METAL TRADES' ADVERTISER.

Italias a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to

It is handsemely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of excepi value for advertisements. Sold to non-subscribers at 75 cents.

THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer,

s published every fourth week in connection with the extensive and world-wide circulation of the Ironmonger itself. The dates of its publication for next twelve months will be as follows:

MAY 36. JUNE 33. JULY 31. AUGUST 18, SEPTEMBER 15, OCTOBER 13, NOVEMBER 10. DECEMBER 8, 1883, JANUARY 5, FEBRUAR 3, and MARCH 1 and 29, 1884.

This supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only with reach, but in the native language of eighty millions of German, twenty eight millions of Italian, and fifty-one millions of Spanish speaking people; or, all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

Advertisements are inserted in any language at the following

MODERATE TARIFF.

Size of Page—13% Inches Deep by 9% Inches Wide

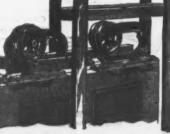
	13 INSERTIONS, each net.	7 INSERTIONS, each net.	insertions, each net.	*	INSERTIONS, each net.	7 INSERTIONS, each net.	INSERTIONS, each net.
One page		\$33.75	\$37.50	Quarter page		\$11.25	\$12.50
Two-thirds page	22.00	34.75	27.50	One-sixth page		7.00	7.75
Half page One-third page	17.00	19.15	15.65	One-sixteenth page	3.20	3.40	4.00

Advertisers will do well to use Illustrations freely. Where econo ny of space is an object, a left page illustrated and described in one language can be suitably described in four or more languages on the opposite or right page without illustrating.

THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of more than twenty years is concerned, will be covered by The Foreign Supplement at least twice a year. Thus a Price List of Advertisement inserted in the Ironmonger and Foreign Supplement is a strikingly powerful and most efficient way of publicity, not to be compared with any of the other ordinary channels of communication.

THE RICHARDS HOUSE-DOOR HANGER FEED WATER HEATER & PUR!FIER, FOR SLIDING DOORS.



They are simple to hang, massive and strong, without a single weak point. Adaptable to all widths of doors from two to twelve feet, single or double, and require no track on the floor. The only absolutely anti-friction top hanger in the market. There are no plates to mortise in; no matching of hardware, and no defacing of deors. The trade are required to carry but one size in stock, the run being about forty inches longer than the largest sheave upon the market. Every set guaranteed. Write for quotations.

MANUFACTURED BY

WILCOX MFG. COMPANY. AURORA, ILL.

THE LOW PATENT



BRIDGEPORT, CONN.

HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets, PHILADELPHIA.

SKEW-BACK SAWS.



This Saw has all the latest improvements in Hand Saws, and is warranted superior to all others, and is giving entire satisfaction.

We call the attention of the trade to our new styles of

SAWS. HAND COMMON

the cheapest in the market. We are also offering

SUPERIOR CROSS-CUT

FOR THE FALL TRADE.

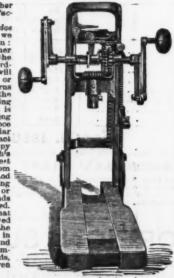
Send for Price List.

SAUNDERS' PATENT

FOR BUILDERS' AND FRAMERS' USE,

are universally acknowledged to be superior to all other Boring Machines, and we guarantee to give better satisfaction than any other machine.

Ship Builders, House Builders, Dock Builders, Bridge Builders, Carpenters and Formers please notice what we claim for our machine, and we guarantee all thatwe claim: First, that it will do nearly double the work of any other machine in the same I agth of time, with greater case to the operator; that we can regulate the speed of the bit according to the size of the same, or to suit the operator; it will drive the bit any required depth, and the bit or auger returns from the hole by the same automatic motion without the operator to any required depth, and the bit or auger returns from the hole by the same automatic motion without the operator stopping the machine; at the same time clearing itself and leaving the hole entirely free from chips; it is gauged to bore such a depth as may suit the overator, boring two or more holes at exactly the same depth after beling once set, without any attention from the operator; it is an angular machine it can be placed it so small a compass as to occupy but luttle soom in a carpenter's tool chest, and while in this compact form it can be carried in the hand with the greatest case and convenience; it is the most dumble machine, from the fact that we use the best material in its construction, and each part can be duplicated in case of accident by send ing directly to us. We finish the ironwork with a baked or heated Japan finish which enables it to withstand all kinds of weather, the woodwork being rubbed in oil and shellaced. They are the chespest Boring Machine. Thus auger is the best Boring Machine Auger in connection with this machine. Thus auger is the best Boring Machine Auger made, being a self-clearer in gummor knotty wood. We offer the Borer, boxed and doilvered on board cars, for \$6 with full set Oladwin Improved Augers. 18 qrs., \$9; or with extra finished beds, \$6.5.0, and full set augers, 18 qrs., \$9.50. A discount given for



THE W. B. WELLS MFG. CO., Ashaway, R. I.

LOUDERBACK GILBERT & CO., 33 Chambers St., New York. Agents.
TILLMAN & McFADDEN, 607 Market street, Philadelphia, Agents.
BUHL, SONS & CO., Detroit, Mich., Agents.
A. W. BINGHAM & CO., Cleveland, Chio. Agents.
SIMMONS HARDWARE CO., St. Louis, Mo., Agents.
GORDON HIRDWARE CO., San Francisco, Cal., Agents.
HODGE & HOMER, 47 Randolph Street, Chicago, Ill., Agents.





WROUGHT IRON TACKLE BLOCKS.

Swivel Hooks for Rope or Chain, POLISHED GROOVES, ALL SIZES IN STOCK. Also Pulley Blocks for Wire Rope,

Headquarters for the

RVING BRAND WOODEN PULLEY BLOCKS, MCCOY & SANDERS, Manufturers,

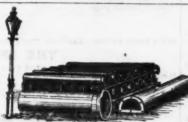
26 Warren Street, New York,

AGENTS IN ALL FOREIGN COUNTRIES.



HILADELPHIA Branch Office, 605 Seventh St. Washin

M. HOWBON, Engineer and Solicitor of Pates (WHON, Attorney at Law and Counsel in Pates MERCES POIN GENERAL AND



Philadelphia,

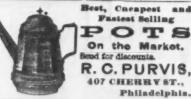
Cast Iron Pipe FOR WATER AND GAS,

Lamp Posts, Valves, &c., Mathew's Pat. Anti-Freezing Hydrants. 400 CHESTNUT STREET.



The BEST and CHEAPEST in the WORLD. We monly guarantee it a good scraper, but can safely at this no equal. Price, \$25. Liberal discount agents. Send for circulars. Address F. G. AUSTIN,
*kanenteles, N. Y.

BOX 293. LEVER Lemon Squeezer, R. ONDERDONK.



MACHINERY FOR or all sizes to any Longth. JOHN ADT New Haven, Conn., U. S. A.



Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FRO N FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each

Especial attention is called to the material and workmanship exhibited in these pumps.

LIST PRICE, 88.

THE NEW ENGLAND BUTT CO. PROVIDENCE, R. I.

NEW YORK OFFICE, 99 Chambers St.

HENLEY'S CHALLENGE



LIBERAL TERMS TO THE TRADE For Prices, Circulars and further particulars, address, mentioning The Iron Age, M. C. HENLEY, Patentee and Manufacturer. 309 North Fourteenth Street, RICHMOND, IND.

MORSE TWIST DRILL AND MACHINE CO.

NEW BRDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill, Beach's Patent Self-Centering Chuck, Solid and Shell Reamers, BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS. DRILL GRINDING MACHINES. TAPER REAMERS, MILLING

CUTTERS AND SPECIAL TOOLS TO ORDER All Tools exact to Whitworth Standard Gauges.

GEO, R. STETSON, Supt.

EDWARD & TABER Tro

Ohly Book Pile On State of the Control of the Contr

PECK'S DROP LIFTER is the only one which has its parts

Can be attached to any drop now in use.

Send for Illustrated Catalogue.

Cor. Lloyd and River Sts. New Haven, Conn.

GENERAL OFFICE and FACTORY, Cuyahoga Falls, 0.



Gener'l New England Agents

JOHN WALES & CO.,

239 & 241 Franklin St., BOSTON, MASS Western Agent: S. E. BLISS.

89 Lake Street, CHICAGO, ILL Louisville, Ky: BOYD, HUBBERT & JUSTL 636 West Main St.

Cincinnati, Ohio: GEO. KINSEY & CO. Central Avenue.

MATTHIESSEN & HEGELER ZINC COMPAN)

LA SALLE, ILLINOIS.

Refined Spelter, Sheet Zinc and Sulphuric Acid.

ALL ORDERS FILLED PROMPTLY.

rn

ch

he ted

0.

er.

ter I

TO F

0

nta

AASS

UST

nd

May 10, 1888.	
PHILADELPHIA.	
Corrected Weekly by Lloyd, Supplies & Walton.) Terms, 30 days. For 60 or 90 days, interest added at 10%	100
per cent. per annum.	
Cyer 200 lbs. 114c Cyer 200 lbs. 154c Trenton. 104 Eagle Anvils, American, 100. dls 20 % Apple Parers. 2600 net Penn Apple Parers. 2600 net Lots of 10 to 24 dozen special prices.	
Bay Bille I dach I alor	6
Hunt's Kentucky and Yankee.per dos \$8,50 @ 0.00 Robert Mass. \$8,00 @ 0.00 Robert Mass. \$7,00 @ 0.00 Bevesed Axes. \$7,00 and 50 net and 50 net Double Bit Axes. net \$8,40 @ 0.40	9000
Angers and Auger Bits.—New List January 7, 1880- Bates' Nut Augers	7
Double Bit Axesnet	-
Balances Light and Common	
Bering Machines Upright, without AugersList 5.50 dis 1625 4	4
Bering Machines Upright, without Augers. List 5.50 dls 45@cc 4 Angular, without Augers dis 8c @ 8c 10 5 Philadelphis mew list dis 70%10 5 Stanley, Wrought Shutter dis 4c% 5 Braces. Barber? dis 4c% 5 Backs dis 50 8 Bpofford dis 50 4 American Bali dis 5,5	ī
American Ball	
Cast Loose Joint, Narrow dis 5,5210 s Broad dis 5,5210 s Acorn, Loose Pin dis 50x10 s Acorn, Loose Pin dis 50x10 s Acorn, Loose Pin dis 50x10 s	
American Ball	C
Parker. dis 70 & 2 % Clark dis 70 & 2 % Clark dis 70 & 2 % Clark dis 70 & 2 % dis 70 % dis	1 4 1
Chains.—German Raiter and Coil. list December 31 1881	E
Charles	1 3 2
Chisels.	3
Gefor Mills. Box and Side, new list Jan. v.	20.00
file. die 45% Enterprise. die 25% Ontery,—Walden Pocket new list net Fena Knife Co. new list net Landers, Fra y & Clark J. Russell & Co., Lamon & Goodnow Mrg. Co. and Meriden Cutiery Co., Manu- facturers' prices net.	-
Brawing Raives. Hart Mfg. Co.'sdis 6c&10 %	0.0740.00
### Pry Pans. Class	3 2
#iles	-
Futing Machines. Engle—34 in roll	
Payorite com Fluter & Sad Iron W dog &to so not	1
Yerkes & Plumb's, new list	8 10
Disson Loop Handles Crosscut	8 8
Yerkes & Plumb, new list	1:
Huns- Hinges- dia 25 & 10 5 dorse Nails- Nos. 5 6 7 8 9 10 Globe- 4 21 19 18 17 16 dia 125 & Vulcan	- M 200,000,000
Ausable 90 red and Pt 4 20 27 25 24 23 22 dls socios Pol'ed and Pt 4.31 28 26 25 24 23 dls socios	2000
Clinton	1
Wadsworth	on concept age.
Branford	LA K
Hay and Straw K nives 12 50 19 dis 50x103	- 日日日本の日本
Lanterns. Buckeye	2 2.4
♥ dos	8000
Long and Short Cutternow list40 %	GO G.T.
Pennaylvania Patteru dis 40 % Molasses Gates dis 25 % Heasuring Faucets dis 25 % Robblina' Gates dis 70ctrof Linceln's dis 60c10 \$\frac{1}{2}\$ Landers, Frary & Clark's Fetroleum dis 60c10 \$\frac{1}{2}\$ Landers, Frary & Clark's Fetroleum dis 20c10 \$\frac{1}{2}\$ Cork Lined dis 60c10 \$\frac{1}{2}\$ dis 50c10 \$\frac{1}{	A STATE
Landers, Frary & Clark's Petroleumdis 20&10 % Brass Liquor Cocks, new list Jan. r 1866. dis 46 % Cork Lined	T
Dixon's.	60
American	900 L
Cork Lined	A
NOR-AGJUSTROIS	P
	ZZZZ
Stanley Ivory dis 546 to 5 Stees yards.—Hart's Pattern dis 33 62 to 5 Stees yards.—Hart's Pattern dis 33 62 to 5 Stees yards.—Hart's Pattern dis 33 62 to 5	NN
Lbe 60 100 150 15.60 10.75 19.50	ES C
Suares. Iteel and Irondis to ; full case distokroft for cash Try Souares, Stanleydis to distokroft for cash Try Souaresdis so s Seythes, Golden Clipper, Damascus Blade, Soxed and Sharpened.	ZZ
Clipper No. 10. Bronsed Blade, Boxed and	23
A COURT OF THE PROPERTY OF THE	25 15 15
Disston's Hand, Panel and Rip. dis 205 Disston's Cross-Cut No. 2, Plain Tooth dis 405 Cross-Cut No. 2, Plain Tooth dis 405 Patent Tooth dis 405 Champion Footh dis 405 Soyaton's Lightning Cross Cut, new list. dis 405 Lightning Block Saws, cross bar. dis 405 Shayels and Spandes.	13
Soynton's Lightning Cross Cut, new listdis 40 % Lightning Buck Saws, cross bardis 40 % Cityer Amos & Sone new list	12 16
Elephening Buck Saws, cross bar., dis 40 S Shevels and Spades. Oliver Ames & Sons, new list. dis rescort Orients. dis sockets Soviand. Fetter Patent. dis 3 x	3/1
100	130
Rindostan Oil Sterne No. 2 2 5 6 1 136 net	Ju No

dis 33% %

	1	1
	Round Head Brass, new list Dec. 27dis. 40 & re \$ Round Head Iron, new list Dec. 27dis. 45 & re \$	
6	Round Head Iron, new list Dec. 27,dis. 4, & m 2 m 2	
	Parker's dis 50 & Tinned dis 10 & Control of the 10 of t	36 8 1-16 34 8
	Gem No/3 small Jap'd \$2.00 { dis 50 & 10 \$ "No.2 medium Jap'd 2.75 } dis 50 & 10 \$	7-32 3-16 5-32 5-11 Oil
5	Other Standard Springs	đư
0	Single No. o, per dos. net	Ore
000	Stove Polish.—Gem. 9 gross \$4.50, dis 1064 5 Dixon. 6.00, dis 107 Fine Fit	5-16 54 8 7-32 3-16
t	Tacks. dis socito \ 8hoc Nalis-4-5, and over sc. dis socito \ 8hoc Nalis-4-5, and over sc. to \(\) " 25-6, and under 9c to \(\) Double Peinted Tacks. dis soci \(\)	1-ze
LEN	Double Psinted Tacks	Cri
× × ×	im. Oneida—Newnouse list, first qual dis 5,55, 6 to 5 Vises,—Solid Box. Trenton new list	Op
KKK	Traps, Genuine Oneida—Newhouse. dis 35 4 Im. Oneida—Newhouse list, first qual dis 55 4 60 5 Visea.—Solid Box Trenton new list dis 56 Wrenches.—Agricultural dis 56 5 Coes' Genuine. dis 56 5 Coes' Mechanics' dis 56 5 Wire. dis 56 63 5 Wire. dis 56 63 5	To
8	Bright or Ann'd, Ne. o to 18	Att
5 1 K	" Mail. Bar. dis 75 k Wire. Bright or Ann'd. Ne. oto 18. dis 25% to 55 % " No. 19 to 26. dis 60 to 60 % " No. 27 to 26. dis 60 to 60 % " No. 27 to 26. dis 60 to 60 % Tinned Broom Wire. dis 55 to 57% % Galvanized Barb Wire. dis 55 to 57% % Galvanized Barb Wire. &c Galvanized Barb Wire. &c Galvanized No. 7 to 18. Market List, dis 42% to 45 % Wringers. Perries No. 24%.	Fro
*	Galvanized No. 7 to 18. Market List, dis 425 to 45 to Wringers.	Bici
5 5	No. 2 45.00 Universal No. 2½ 42.00 No. 2 42.00 No. 2 45.00	Pili Con Ro
K	Pecriess No. 24.	Spi Tra For
2		Pla 836
X X X X	PITTSBURGH. Merchant Iron.	Boi
6 6 7	TERMS Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent, for cash, if remitted within 10 days from date of invoice.	Boi ti Cir
£ £	For fluctuations and discounts on card rates see weekly Pitts-	Sm
1 21 24	burgh Trade Report.	Squ
5. 5. 5.	156 to 4 by \$6 to 1 inch	Ta; Ho
1	tki and 1% by % to % "	Spi
đ	1 to 1% 2.5c % to 9%	IX3 IX3
22.00	The f . llowing are card rates.	Sol The
5 5	76 to 136 Oval From. 3 to 36 3, 10 % 3.3c 3.3c	For
第 元 日中	74 to 114 inch 4.20 14 inch 4.00 15 to 94 5.70 14 5.50	Cor Ber
Ř.	% Inch Nos. 13 and 14	8pr
K K	13 and 14	Tir Too
% 10	Heavy Bande.	Sie Cu Scy
g so	86 to 36 by 14 and 6-16 "	Ro
T.	\$\frac{8}{2}\$ and \$\frac{8}{2}\$ by \$\frac{1}{2}\$ and \$\frac{1}{2}\$. \$\frac{1}{2}\$ by \$\frac{1}{2}\$ bo \$\frac	Ro
%	1 to 1% by ½ to 3-rb. 3.10 1 to 1½ by Nos. ri and 12. 3.20 ½ and 13-rb by ½ to 3-rb. 3.40	if r
% g	76 and 13-10 by Nos. 11 and 12. 3-50 14 and 11-16 by 160 3-16. 3-70 15 and 11-16 by Nos. 11 and 13. 3-80 15 and orth by to 146 3-380	Ho Gu Spi
K K	6 and 6-10 by Nos. Hand 12. 4-10. 4-	Pip
鬼のち	154 to 4, Nos. 13, 14 and 14	Roi Spt
t	154 to 2, No. 20	En
T K	15g to 2, No. 21	68
N N	15-10, 1, and 15s, No. 22 3-8c 5s, Nos. 13, 14 and 15 5s, Nos. 15, 17 and 18 5s, Nos. 16, 17 and 18	8 5 35 5 14 5 A tlei
XX X	\$6. Nos. 19 and 20	etr
8	13-16, Nos. 10 and 20	P M Dry
0000	15-16, No. 23 4-3C 4-3C 4-3C 4-3C 4-3C 4-3C 4-3C 4-3	Lit
9	96. NOs. 19 8101 20. 6-20 56. NO. 21 6-30 36. NO. 22 6-30 10. NOs. 22 6-40	tro
6 6	II-16, Nos. 10, 17 and 18 430 II-16, Nos. 19 and 20 430 II-16, No. 21 410	Die
	19-16, No. 21	_
t	\$\frac{5}{96}\$, No.81, 19 and 20 \\ \$\frac{5}{26}\$, No. 21. \\ \$\frac{5}{2}\$, No. 22. \\ \$\frac{5}{2}\$, No. 23. \\ \$\frac{5}{2}\$, No. 33. \\ \$\frac{5}{2}\$, No. 34. \\ \$\frac{5}{2}\$, No. 35. \\ \$\frac{5}{2}\$, No. 13, 14 and 15. \\ \$\frac{5}{2}\$, No. 16, 17 and 18. \\ \$\frac{5}{2}\$, No. 19 and 20. \\ \$\frac{5}{2}\$, No. 19 \\ \$\frac{5}{2}\$, No. 21. \\ \$\frac{5}{2}\$, No. 22. \\ \$\frac{5}{2}\$, No. 23. \\ \$\frac{5}{2}\$, No. 24. \\ \$\frac{5}{2}\$, No. 25. \\ \$\fra	5 2
£.	9-16, Nos. 13, 14 and 15. 4-50 9-10, Nos. 16, 17 and 18. 4-70 9-16, Nos. 19 and 20. 4-80	18 X 16 X 26 X
	9 16. No. 23	16 E 30 E
	Nos. 19 and 20	34 X 36 X
	" No. 73	6 X II X II X II X
	1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.	26 X 26 X
	to specified lengens.	90 X 90 X 34 X 36 X
	1 to 11 lbs, per set of 6 hoops	Aiglas
	All Iron, including Tire	inch
	Sheet Iron. Common. Charcoal. Juniata.	Axe
	No. 10 to 14	Dra
	No. 27470 4.30 7.70	Hoe Han
	No. 28 Lic a.5c All shee.s No. 18 and lighter, over 30 inches wide, not less than 2.1cc extra. Wood's Fatent Planished Sheet.	Saw
-	All shoe.s No. 18 and lighter, over 30 inches wide, not less that not less that the state of the	41
-	Nos. 25 and 26	Shor Space
1		
-	18	FE
-	1½ by ½	
-	8 lbs. to the yard2.cc 20 lbs. to the yard2.8c 12 2.8c 28 2.8c 2.	
1	## Bibs. to the yard	Wa
	2) by 5 to " 5-lb. Rail	
-		F
1	Guard Iron %x%x% and %x%x%	TH
-	Drag Bars 5.30 Dropper Bars 8.40 Colfeign and Candalda Iron	

	Naile. See Pittsburgh Trade Report.
	Best Quality Refined Cast Steel.
	Square. Flat, Octagon and Round. % to 3 inches, inclusive
	\(\) \(\)
30	Oil Well Stool Forgings
5	Machinery Steel. Ordinary Street M. to a technical Crucible. Open Hearth
0 5	Round
	7-32 inch
6	8quare, Piat and Octagon, 16c extra throughout the list.
	Cut to specified lengths, %c extra.
	Crucible Cast Steel
-	Best. ad Qual. ad Qual. Open Hearth To at gauge 120 fig gc gc. extra for each additional gauge.
6	Cut to multiples or specified lengths, 14c. extra-
	Auger and Auger Bit
	Frog Points and Plates 100 100 100 100 100 100 100 100 100 10
	and Mattock, beveled (rolled). 8546 Skate Steel. 96
0	Bkate Steel
0 0 0	Roller
0	Forged Crank Pins and Lathe Spindles
	Spindle, subject to Machinery classification significant and subject to Machinery classification significant and Lathe Spindles it. Forged Crank Pins and Lathe Spindles it. Forged to shapes it. Slide Bars, plain. Forged to shapes. Significant shapes.
8	Botten Pine Box and Pine State or Bessemer
r	thick. Boiler, Fire-Box and Fine Sheets, not less than 3-to thick. Circulars and semi-circulars, when ordered separately.
4	Smoke Stack, to shape.
	Locomotive Tank Steel.
	inch and over
000	Locomotive Tank Steel. File Cast Steel. Square. Round. Haif Round and Flat Bastard. 8 inch and over. Mill Saw. 8-inch and over. Taper, 3/s-inch and over. Horse and Shoe Rasp. Spring Cust Steel.
200	spiral and Taper, cut to lengths
200	rx's and over
2 44 50	i and is-lox/s and s-32, 5,x3-10 and t-32 objects and 5,x1/s and 3-32 and 12 g it. Solid Sare Cast Steel.
	Three and Five Ply Cast Steel
200	Horse Rake Steel e at to lengths, Crucible
	Beveled Hoe and Shovel Steel in Pars. 8'20' Crucible Piew Steel in slabs. 8'20'
2	Sprins
200	Plow.
200	Axle Billets40
8	Scythe Back Steel
0 0	The state of the s
0.0	Thrashor Steel
0000	if remitted within 20 days. Rolls and Castings.
000	Furnace Floor and Straightening Plates
20.00	Spindles and coupling boxes
2	Pipe Mili Castings
20 00 0	Pipe Mill Castings under to lbs. C C Spur and Bevei Wheels, large. J C Spur and Bevei Wheels, large. J C Pulleys up to so inches small. 494.
2000	Engine Castings, light
20.00	6 to fn. diam to so in. iong
	25 50 24 lB. " IS to 22 in "
20 20 2	tlement as hererofore, prices quoted being net.
	Strictly Pure White Lead in OH. in kegs. 6/4c.; tn 2: B Tin Pails, 19c. W B over keg price: 12/4 B Tin Pails, 1c W B over keg price: 12/4 B Tin Pails, 1c W B over keg price: assorted, 1 to 5 B cans. 3c, per B over keg price:
	Day White Land in harmale
200	Litharge (Potter's Lead) byc: in barrels 6)4c Freights equalised with all pulpts where White
	Lead is made. Terms: Note at sixty days, or if paid within 15 days from date of invoice a discount of 216 per cent, will be allowed, but not otherwise.
	Window Giass.
	Discount, 70 % on Bingle Strength, 70 & 10 % on Doub's.
	Size. AA. A B. C.
	5 x 8 to 10 x 15
	10.75 9.75 8.75 7.75
	16 X 46 to 30 X 50 15.00 14.0c 11.34 10.54
	\$4 X 56 to 34 X 60
	Double Strength. 6 x 8 to 10 x 15 12,75 11.75 10.75 10.00
	16 X 22 60 30 X 30
-	26 X 26 to 26 X 44
ı	30 X 53 to 36 X 54
1	30 X 00 to 40 X 00
	An additional to per cent, with be charged for all glass more than 40 inches wide. All sisce above to inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.
1	Hubbard, Bakewell & Ca.'s Goods.
	Axes, Single Bit Linningstt Per dos 40 co
I	Double Bit, Lippincott. 15.00 James & Co 15.00 Drain Tools, list. 15.00
1	Hoos, Planters' dis sc
1	Handled, Square Kye, Germandis 25%
-	Handles, Cross Cut
-	Saws, Circular
-	" Long dis 405 Cross Cut, H. B. & Co., Champion, Per ft. net
1	"Long dls 405 Cross Cut, H. B. & Co., Champion, Fer ft. 10
	"Long
	"Long dls 405 Cross Cut, H. B. & Co., Champion, Fer ft. 10

THE YALE CASTER. A New Caster,

with at least ten distinct improve-ments over anything the kind here tefore made.

For Funiture of a kinds, Flower Stands, Pianos, Stove and Warehouse Trucks, and anything that needs a Caster.

Ten Sizes.

Six of the largest sizes now read and four more sizes will follow soon. Send for Circular.

YALE CASTER CO., New Haven, Conn.

HENRY B. NEWHALL CO., 105 Chambers St., New York, AGENTS.

See Iron Age editorial, March 22.



THE PERFECT SCRAPER,

Made from one sheet of Steel, 3-16 of an inch thick, PRESSED into shape. It is without Seam, Joint or Rivet, and is the Lightest, Strongest and most Durable Scraper male. Fills easier and cleans better than any other, and there is nothing about it to get out of repair. We also manufacture the well-known

DOTY'S AUTOMATIC REVOLVING SCRAPERS WHEELBARROWS, ROAD PLOWS, &c.

For Prices, Terms &c., address KILBOURNE & JACOBS MFG. CO., Columbus, Ohio, U. S. A.

JOHN A. McCOSH, Sec. and Treas. LIGHTEST & BEST 4 POINTED BARB CENSED AND PATENTED.

Chicago, Nos. 16 and 18 West Lake Street.



SAMSON NOVELTY WORKS, Nos. 14 & 16 Main St., De Kalb, Ills., AND IN CANADA BY

BULLOCK HARDWARE CO., Otterville, Ontario.

MASTER-KEYED BRASS PADLOCKS. in sets of any required number, made to order. Each lock has 2 special keys, which will unlock no other. Each Set has a Master-Key which will open the whole set-a great convenience in all shops and factories. Thousands in use. Satisfaction invariably given.

All who use PADLOCKS FOR SECURITY should examine "Miller's 6-Lever," of which there are now made nearly 20 modifications. The Franklin Institute has awarded to the inventor the John Scott Medal and Premium, for account of the Board of City Trusts of the City of Philadelphia.

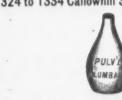
FAIRBANKS & CO., Agents, 311 Broadway, New York, New Orleans, Pittsburgh, Buffalo, Albany. Philadelphia Baltimore, &c.

PHILADELPHIA BLACK LEAD CRUCIBLE WORKS. 1324 to 1334 Callowhill St., Philadelphia, Pa.

The Best and Cheapest in the Market. BRASS CRUCIBLE arranted to heat water by exhaust steam from 206° to 212° Fahrenheit.

OR DESCRIPTION AND PRICE APPLY TO

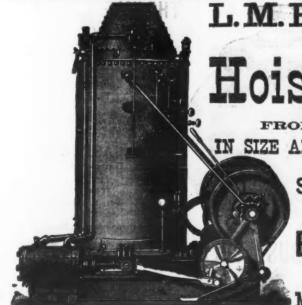
THE NATIONAL PIPE BENDING CO. NEW HAVEN, CONN.







R. B. SEIDEL. Manufacturer of SUPERIOR BLACK LEAD CRUCIBLES.
For melting Steel, Brace and other metals. Black Lead Ropper, &c., for Benemer Steel Rabors, Also many facturer of paperter quality Hammered Charges in the order of different places and phopos.



L.M.RUMSEYMFG.CO. J. F. WOLLENSAK'S Cuttery.—Pocket American Shear Co.*

Square Handle.

Square Handle.

Stocking.

Stocking.

Chatlery.—Pocket American Shear Co.*

Square Handle.

Stocking.

Stocking.

Chatlery.—Pocket American Shear Co.*

Square Handle.

Stocking.

Stocking. ST. LOUIS, MO.

Engines

FROM 4 TO 50 HORSE POWER, IN SIZE AND STYLE TO SUIT REQUIREMENTS.

> SPECIAL COAL-HOISTING ENGINES DOUBLE-CYLINDER MINING ENGINES,

ENGINES AND BOILERS

Pumping Machinery, MINING AND ENGINEERS' SUPPLIES.

AMERICAN BOLT CO., Lowell, Mass.,

Bolts, Nuts, Washers, Chain Links, Car Bolts, Bridge Bolts, Lag Screws, &c.

ALL THAT IS LEFT.





THE COVERT PATENT SNAP.

Patented Feb. 25, 1868; Sept. 30, 1873; and March 16, 1875. Reissued Jan. 4, 1881.

Covert's Patent Harness Snaps, Chain and Rope Goods. These Goods are sold by all Leading Jobbers in general and Saddlery Hardware, at manufacturers' prices. Send for illustrated catalogue and price list.

COVERT MFG. CO., WEST TROY, N. Y.

PORTER MANUFACTURING COMPAN PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC EYERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER. NO MORTISING OR TENONING, CANNOT SAG OR WARP, AND ANY ONE CAN MAKE THEM. SEND FOR PRICE LIST.

WELLS' CAST METAL UNBREAKABLE LAMPS & OIL FEEDERS. A. C. WELLS & CO., Patentees, Market St., Manc Entirely Superseding tin goods, at they DO NOT LEAK!! or BREAK! Adopted in the English Governm In writ-ing please mention this paper. and finest Railways, works and Steamship SOLE WHOLESALE AGENTS FOR THE DESTRU STATES. PAINE, DIEHL & CO., 7 Strawberry St., PHILA., PA.

CRAHAM & HAINES. WE.PICKETT & SON.

113 CHAMBERS ST

164.LAKE ST

THE AMERICAN MACHINE CO., MANUFACTURERS OF

AGENTS WANTED EVERYWHERE. LIBERAL TERMS

HARDWARE SPECIALTIES.

Lehigh Ave. and American St., Philadelphia. No. 128 Chambers St., New York. SPECIALTIES: Fluting Machines, Hand Fluters, Plaiting bargains. Machines, Christmas Tree Holders, Bickford Portable Pump, Mrs. Potts' Patent Cold-Handle "Crown" Irons, Ice Cream Freezers and Cake Mixing Machines.

STAR LOCK WORKS.

Door Springs, Pad Locks,
Dead Latches,

EXAMPLE 100 Trunk Stays,
Keys, &c, 110 South 8th St., and Sansom, bet. 8th and 9th, PHILADELPHIA.



HILLEBRAND & WOLF.



GUN POWDER. Laflin & Rand Powder Co

ORANGE LIGHTNING, ORANGE DUCKING,

ORANGE RIFLE more popular than any Powder now in use Blasting Powder and Electrica Apparatus. SAFETY FUSE, PRICTIONAL & PLATINUM

FUSES. Pamphlets showing alsos of grain sent free,



RELIABLE DURABLE. The constantly increasing Sales of this Injector attests its Superiority as a Boiler Feeder,

Manufactured by JAMES JENKS, 48, 50, 52 and 54 Randolph St.,

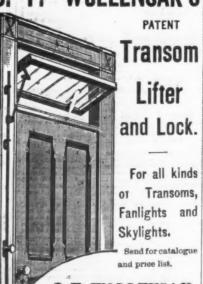
DETROIT, MICH.

NOTICE.

To the Hardware Trade, Wholesale and Retail.

Before buying, send to me for quotations. Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware. Have also an immense stock of special jeb lots in which I can give decided

A. W. WHEELER, 141 Lake Street, CHICAGO.



For all kinds or Transoms, Skylights.

J. F. WOLLENSAK, Patentee and Sole Manufacturer, CHICAGO, ILL.



SNIGGS & CO., 210 Terrace, Buffalo, N. Y.



BOSTON.

heporates of materials, and
Anvil & Visc.— No. 1, \$4.25; 2, 4.25; 3, 3.50 eachdis 25 \$
Augura & Bitts,—Snell'a Auger dis socio 5 L'Hommedieu's Shi Auger dis 10 dis 15 Jenning's Bitts. dis socio 5 Cook's Bitts. dis socio 5 Shepardson's Double-Cut Bitts. dis socio 5 Shepardson's Double Gimiets. dis so
Shearn's Extension Hollow Augers No. 2, \$\vec{V}\$ dos., \$\vec{S}\$\$, 60.00 list. dis 20 \$ Bonney's Extension Hollow Augers. \$\vec{V}\$\$ dos. \$\vec{S}\$\$, 60.00 list. dis 20 \$ Bonney's Extension Hollow Augers. \$\vec{V}\$\$ dos \$\vec{S}\$\$, 60.00 list. dis 50 \$ Griswold Bitts
Axes.—Blue Jackets. ₱ doz \$0.00 Red Cross ₱ doz \$0.00 Red Cross Handled ₱ doz 12.00 Dewas Handled Boys' dis 33½ %
Ax Handles. # doz \$2.50 Oak Extra, 34 In., No. A. # doz 2.50 Oak Extra, 34 In., No. B. # doz 2.50 Oak Extra, 34 In., No. B. # doz 2.50 Oak Extra, 34 In., No. B. # doz 2.50 Oak Extra, 34 In., No. C. # doz 1.50 # doz 1.50 # doz 1.50
Axle Clips
Barn Door Rail.
Belis.—Connel's Crank Gong, reduced listdis 15&10 \$

Belts.—Norway Iron Carriage... Common Iron Carriage..... dis 74 % Hackus* dis vax.—Holly Scroll Saw ... each 82.25
Demas Lathe and Scroll Saw ... each 82.25
Demas Lathe and Scroll Saw ... each 6.50
Bracket Saws there quality, to No. 5. \$\psi\$ gro 0.75
Steel Frame, with patterns. \$\psi\$ doz 6.50
Lester ... dds 50
New Rogers, all Iron ... dis 25 \$ New Rogers, all Iron.

Bracket Saw Blades,—Griffith's pat. Fgross 740

Brackets.—

H. B. & M. Flower Pot. reduced list. dis 562 to 8

Rronsed Shelf, M. B. & D., new list. dis 56 to 6

Rronsed Shelf, M. B. & D., new list. dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Flat-Head Iron new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Flat-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Brass. new list, dis 62 to 8

American Round-Head Br Store Sheit.

Butts.—Union Fast Joint.
Union Loose Joint.
Union Loose Joint.
Union Japanned Acorn.
Union Silvered Acorn.
Union Boston Finish.
Union Spiral Spring.
Wrought Brass.....

Carriage Bolts.-Eagle Norway. Carriage Jacks.-Climax No. 1. Cartridges .- U. S. Cartridge Co.

Cow Ties.

No. 30, 3 ft. No. 6 Wire, with toggle.

No. 35, 3 ft. No. 6 Wire, with snap.

No. 40, 356 feet No. 6 Wire, with snap.

No. 40, 356 feet No. 6 Wire, with snap.

No. 50, 4 ft. No. 4 Wire, with snap.

No. 50, 4 ft. No. 4 Wire, with snap.

No. 50, 4 ft. No. 4 Wire, with snap.

No. 50, 4 ft. No. 5 Wire, with snap.

No. 50, 4 ft. No. 5 Wire, with snap.

Oction.—Frass. L. F. & Co.

Ogrenage.—Bankla, usual trade dis to.

186.

Craw-Bare.-Cast Steel...

May 10, 1883. Lap Bolster, Oval Handle.
Sticking
Skinning
Butcher, Common Round Handle, Wood's...
Shoe Knives, Wood's... Transom

Deg Collars...

Deg C Dividers.-Cook's......dis 25 \$..dis 20 % Drawer Knobs.—Thurston's....
Drills.—Morse Bitt Stock.

Morse Straight Shank. Fluting Machines.—Knox list, \$4.00...... Fanlights and Ferks, -W. C. & Co. Manure. dis 20 % Gimler Bits, - Genuine German, No. 125, 1-32 to 8-32, per dos \$1.00 Pierce's per dos .80 Hangers & Rellers,-Anti-Friction. Climax.....Common Hangers.......

Hinges.—Strap and T (new list)....
Providence Plate...
Wrought Screw Hook.
Hoes.—W. C. & Co.'s... Hooks and Staples .- Brewers' (new list) dis 60 %dis 20 % ...dis 50 % Lead. -Sheet.

Pipe
Lorks.—Norwalk
Eagle Cabinet.
Eagle Trunk
W. Wilcox & Co., Padlocks.
Manure Forks.—W. C. & Co.
Mattacks.—
K. P. & Co., Long Cutter, \$15.50 \(\psi\$ dos.
K. P. & Co., Short Cutter, \$15.50 \(\psi\$ dos.
K. P. & Co., Short Cutter, \$16.00 \(\psi\$ dos.
Measuring Tapes.—Eddy's.

Meat Cutters.—Miles' Challenge.
Hale's, (new list).
American. Mouse Traps.—Delusion......
Novelty..... Picks. -k. P. & Co., Adze Eye, 5 to 5 B \$12.00. K P. & Co., Adze Eye, 6 to 7 B \$13.00...

Bailey's.....Plated Ware.-Rogers & Bro...... Pilers.—Vom Cleff & Co.'s. Button's Wire Pliers..... Plumb & Levels .- Stanley R. & L. Co ... dis 65&10 5 Pulley Blocks.
Pumpa.—Union Manufacturing Co.
iron Cistern.
iron Pitcher Spott.
Copper Rivers.—Black (new list)..... Carriage in 10 th papers (new list)... Razors .- Torrey's .. Razor Straps, Torrey's... Rules, Stanley, Boxwood... Stanley, Ivory... Snd Irons, Common.....

Lant of the second of the seco Saw Blades,—Dission... W. M. & C. Welch & Griffith, Extra.. Welch & Griffith, No. 3...

dis wo.

dis 40 %

dis 40 %

dis 4210 %

d American Round-Head Brass...new list, dis 40 & 10 \$
American Round-Head Iron...new list, dis 45 & 10 \$
Grillev Round Head Nickel-Flated Common..dis 40 \$ Grilley Round riest strawer tases commun. He on Seythes. — Clippers, it nozes. — \$ 002 25,75 Shaves.—Clippers, it nozes. — \$ 102 25,75 Shaves.—Kanbail's. — \$ 102 25,75 Shaves.—American Shear Co., new dist. — \$ 15 ye Shott.—Tatham's. — \$ 2 ye Shott.—Tatham's. — \$ 2 ye Shott.—Tatham's. — \$ 3 ye Shott.—Shaves.—American shear list. — \$ 3 ye Shottles.—O. Ames. new list. — \$ 3 ye

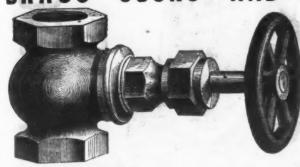
Oneida, Imitation, H. & N.... Blake's. Vises.—Simpson's Adjustable. Howard Vise Co... Prentiss'.

Window Springs.....
Babcock's No. 3....
Babcock's No. 4....
Wire Cieth.—"Clinton". dia 9314 \$ 1.70as \$0.25 gross 4.15 Wire Fence. Scutt's Patent, Painted... Scutt's Patent, Galvanized.... Wire Goods. -Gate Hooks and Eyes, &c., dis sekto \$ Wrenches. -A. G. Coe's... Girard Mfg. Co... Girard Agl... Wringers.-Novelty No 2 for Common Tube....

Soveity No rost
Soveity '3
Excelsior E Stationary Tubs...
Excelsior A with Folding Bench...
Excelsior B

McNab & Harlin Mfg. Co.,

COCKS AND



WATER, and GAS. Wrought Iron Pipe and Fittings, LUMBERS'

For STEAM,

Factory, Paterson, N. J.

MATERIALS, 56 John Street, N. Y.

BLACK AND TINNED IRON RIVETS. PITTSBURGH, PA.,

H. B. NEWHALL CO.,

rers of a very description of First Quality

New York Agents. RIVETS



WM. H. HASKELL CO., Pawtucket, R. I.

(With Gimlet Points,)

ALL KINDS OF

Machine and Plow Bolts,

BOLTS.

HENRY B. NEWHALL CO., and 47 Pearl St., Boston, (J. H. WORK, Manager), EASTERN AGENTS.

STANDARD NUT CO.,

Pittsburgh, Pa.,

MANUPACTURERS OF

Square & Hexagon Nuts,

R. R. FISH BARS,

BOLTS, HENRY B. NEWHALL CO, 105 Chambers St., New York,

and 47 Pearl St., Boston,

(J. H. WORK, Manager),

EASTERN AGENTS.

SPIKES.

RIVETS, &c.

"STAR" Philadelphia

NORWAY IRON Carriage & Tire Bolts.

FANCY HEAD BOLTS. Star Axle Clips, &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry Street, Philadelphia, Pa.

Bradley's Edge Tools.

Butchers' Cleavers, Butchers' Choppers, Axes and Hatchets, Grub Hoes and Mattocks, Mill Picks, Boxichiseis and Scrapers,

Ring Bush Hooks, Ax Eye Bush Hooks, Socket Bush Hooks, Watt's Ship Carpenters' Tools, Carpenters' Brawing Knives, Coopers' and Turpentine Tools. FOR SALE BY

MARTIN DOSCHER, Agent, 85 Chambers Street, N. Y.

AMERICAN BRONZE WORKS. BRONZE AMERICAN BRONZE WORKS.

BRONZE AND BRASS BEARINGS BEARINGS.

AND CONTROL WORK A SPECIALTY OF SPECIAL TYPE OF STREET OF STREET OF SPECIAL TYPE OF STREET OF SPECIAL TYPE OF STREET OF SPECIAL TYPE OF STREET OF STREET OF SPECIAL TYPE OF STREET OF STREET



58 John St., NEW YORK.

Factory at BRIDGEPORT, CT.

MANUFACTURERS OF

Fittings, Valves, Tools,

Goods for Steam, Water, and Gas, Wrought Iron Pipe. &c. Agents for BUNDY'S RADIATORS.

DEANE'S PATENT SOLID STOCKS AND DIES.



WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for exports as well as home trade, and it seems destined

to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land er water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.

VALVES.

Double and Single Gate, 1/2 in. to 48 in.—outside and inside Screws, Indicator, &c., for Gas, Water and Steam. Send for Circular.

Also FIRE HYDRANTS.

BAGNALL &

BOSTON, MASS.

Sole Manufacturers in U. S. A. of our Calabrated

METALINE Improved Sleeve Rolle **Bush Tackle Blocks.**

TACKLE BLOCKS. Try Us with a Sample Order. Bend for Hiustrated Catalogue,

New York Warehouse, 33 South Street.



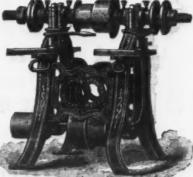




Western Agency: GURNEY & PHALAN, 247 Luke St., CHICAGO. UNION STONE COMPANY,



Patentees and Manufacturers



OF THE UNION EMERY WHEEL.

Emery, Emery Wheel Machinery and Tools A SPECIALTY.

Automatic Knife Grinding Machines, WOOD POLISHING WHEELS, Emery Quartz, Cloth, Corundum, Grinders' and Polishers' Supplies.

Catalogue on Application.

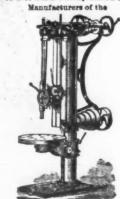


High Speed Engines.

H. H. BALCH, 86 John St., New York

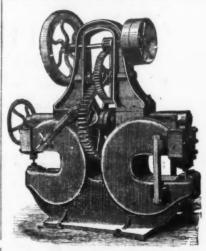






BLAISDELL" UPRIGHT DRILLS And other First-Class Machinists' Tools. COMBINED

KNIVES. PUNCH & SHEARS.



Lambertville Iron Works, A. WELCH.

LAMBERTVILLE, N. J.



THE "EDDY" STRAIGHTWAY FIRE HYDRANTS

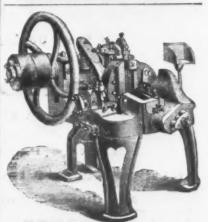
Axe, Hatchet, Powder and Brush Machinery. THE EDDY VALVE COMPANY,
WATERFORD, N. Y.
AGENTS IN ALL PRINCIPAL CITIES.
Send for Price List.

THE LA FRANCE FIRE ENGINE CO.

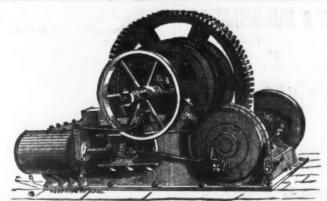


Rotary Steam Fire Engines





PITTSBURCH MFC. CO., Manufagurers of Hail and Spike Machines, Bolts-uts, Washers, Rivets, &c. Costings, Forgings and separatik Work promptly attended to, Office and Works Railroad Sty may 20th , Pittsburg, Fa



FURNACE" HOIST. IRON VERTICAL ENGINE

The above cut represents our Vertical Iron Furnace Hoistiag Engine, having double cylinders fitted with our improved reversing valves, automatic stop and brake, Prices furnished on application for engine alone or for complete outfit. Fatterns on hand for various sizes.

STOKES & PARRISH, 3001 Chestnut St., Philadelphia

SAVED \$ \$ \$ \$

NINETEEN HUNDRED SEVENTY-SEVEN

BOTH NEW AND SECOND-HAND

MACHINE AND BLACKSMITH
TOOLS OF EVERY DESCRIPTION.
WOOD-WORKING MACHINERY IN ALL ITS
BRANCHES. PORTABLE ENGINES. UPRIGHT and HORIZONTAL STATIONA
BY ENGINES, I TO
BY HORSE POWER.
EOX, HORIZONTAL, S.C.F.&CO.
ERS, I TO IOO HORSE POWER. WATER WHEELS, COTTON AND WOOLEN MACHINERY, STEAM
PUMPS, GRISTMILL MACHINERY,
Etc., FULLY DESCRIBED, AND
PRICES ANNEXED,

STEAM STATE OF SAME.

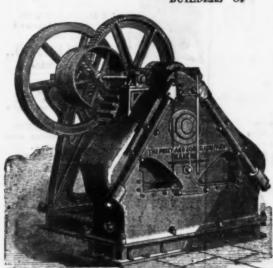
Send stamp for same,]

fstating what you want. _451 In our List No. 23.

We have the Largest Assortment of Machinery to be found in the hands of any firm in the country. Works and Main Office, Manchester, N. H. S. C. FORSAITH & CO.

WILMINGTON, DELAWARE,

BUILDERS OF



STEAM ENGINES, Boilers, Tanks,

MACHINERY FOR ROLL-ING MILLS,

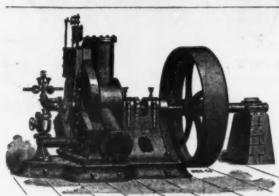
Punches, Shears, Machines for Cutting off and Slitting old Railroad Rails pre vious to being piled in Rolling Males,

Steam Riveting Machines, Applicable to Bridge Builders'

RIGHT AND LEFT ANGLE IRON CUTTERS,

Hydraulic Bending Machines,

HEAVY MACHINERY GENERALLY.



GARDNER'S PATENT Three Cylinder

Most Simple and DURABLE Steam Engine in Use Adapted for any duty. Send for Illustrated CATALOGUE Giving full Description.

EVERY ENGINE WARRANTED. OVER 000 H. PR. IN USE. Correspondence invited. Special Engine for HIGH SPEEDS, price-of which will be quoted upon application. MANUFACTURED

EXCLUSIVELY BY R. DUNBAR & SON, Buffalo, New York, U.S. A.

Of Every Description a Specialty.

ADDRESS,

R. H. BROWN & CO.,

WESTVILLE, CONN.

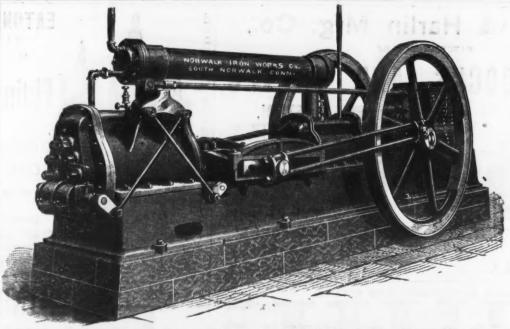
Also Manufacturers of

W. A. CLARK'S PATENT EXPANSIVE BIT,

CLARK'S PATENT HANDLE SCREW DRIVER,

And Other Specialties in Hardware Line.

III Bank St., CLEVELAND, OHIO. Rolar to Wm. Bingham & Co.



THE NORWALK IRON WORKS CO., South Norwalk, Conn.

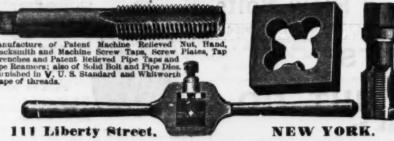
PRESSES & DIES.



SPECIAL MACHINERY FOR TIN & SHEET * METAL WORKERS -BROOKLYN, N.Y.

MANNING, MAXWELL & MOORE,

ole Sales Agents for THE MORSE TWIST DRILL AND MACHINE CO.'S





The best Feeder known for Stationary, Marine and Locomotive Boilers.

REQUIRES NO OILING.

Consumes Less S:eam Than Any Other Boiler Feeder.

SIMPLE, RELIABLE AND ALWAYS IN GRDER.

FAIRBANKS & CO

311 Broadway. NEW YORK.

CINCINNATI MALLEABLE IRON FOUNDRY

JAMES L. HAVEN & CO., No. 56 Plum Street.

Malleable and Gray Iron Castings, Pattern Making, Bronzing. TINNING AND COPPERING TO ORDER.

THOS. H. DALLETT & CO.

THORNE, DeHAVEN & CO., Drilling Machines, 21st Street, above Market, Philadelphia.

PORTABLE DRILLS, Driven by power in any direction. RADIAL DRILLS.
Self-teed-Large Adjustable Box Table. VERTICAL DRILLS, Self-teeding. MULTIPLE DRILLS, 2 to so Spindles. HORIZONTAL BORING AND DRILLING MALSHINGS HAND DRILLS. CAR BOX DRILLS. SPECIAL DRILLS. For Special Work.



BOLTS, NUTS, WASHERS, WOOD SCREWS Upost Rods, Car and Bullders' Forgings
And General Builders' Ironwork. KING & PEROT,

8, M. Cor. American & Xerk Ste., Philadelphia, Pa.

S



DEAD-STROKE POWER HAMMERS.



DIENELT & EISENHARDT, MAKERS,

1810 Howard St., Philadelphia. E. E. GARVIN & CO.,

Machinists and Manufacturers of MILLING MACHINES, DRILL PHESSES, HAND LATHES, TAPPING MACHINES,



Milling Cutters, all Shapes and Sizes. Gear Cutting and Milling in all its Branches. Index Plates Drilled Accurately. Special Tools signed and Built

RUFFI

141 Centre St., New York. Send for Illustrated Catalogue.



Standard Weight Lap Welded WROUGHT IRON PIPE, &c., STEAM PUMPS, &c., STEAM AND RYDRAUTED

Freight & Passenger Elevators, &c. STEAM HOISTING ENGINES, &c MANUFACTURED BY

CRANE BROS. MFG. CO., OHIDAGO.

Band for Detalogue.

Machinery, &c.

LYON'S HAND OR POWER PUNCHES AND SHEARS.



For Round, Flat or Square Iron, Polishing & Buffing Machinery, HYDRAULIC JACKS,

To raise from 9 to 130 tone. Hydraulic Presses for Special & General Use. HYDRAULIC HAND & POWER PUMPS

WATSON & STILLMAN,
(Successors to E. LYON & CO.)
470 B Grand Street, NEW 10BK.
Send for circular of what you want.

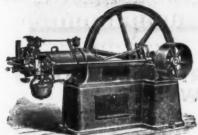


THE MACKENZIE PATENT CUPOLA & BLOWER.

> Smith & Savre Mfg. Co., PROPRIETORS, 245 Broadway, New York.

Cupola has made a great revolution in melting Iron. It differs from an others ring a continuous tuyere, or in other words, the blast enters the fuel at all a bove one ton capacity per hour, they are made oval in form. This brings ast to the center of the furnace with the least resistance and smallest possible nt of power, and in combination with the continuous Tuyere causes complete ton of the air throughout the furnace, and uniform temperature, melting fencen tons an hour with the pressure of blast required to melt two or three tons orininary Cupola. It also enables us to save very largely in times and fuel, the tense of our customers showing a gain of the original that the continuous Tuyere of the two functions of the air and more perfect used to the tense of our customers quality for Casting, ally in light work. This is due to the used of the continuous to the continuous that is t





Working Without Boiler, Steam, Coal, Ashes or Attendance.
Started Instantly by a Match, is gives Full Power Immediately.

When Stopped, all Expense Ceases.
No explosions, no fires nor cinders, no gauges, no pumps, no engineer or other attendant while running. Recommended by insurance companies.
UNSURPASSED IN EVERY RESPECT for hoisting in warehouses, printing ventilating, running

SCHLEICHER, SCHUMM & CO., Engineers and Machinists, N. E. Cor. 33d & Walnut Sts., Phila'phia 214 Rando.ph St., Chicago.

STEPHEN A. MORSE CLEM & MORSE, LATEST PATENTED IMPROVEMENTS. C. M. WILLIAMS. SEND

EDWIN F. MORSE.

Hoisting Machinery, Automatic Hatch Doors, &c. 413 Cherry St., PHILADELPHIA, PA. Branch Office, 108 Liberty St., Nzw York.



HOISTING ENGINES

We are now prepared to deliver (*x12 and 7x12 single cylindered Horizontal Engines, and double cylindered at \$10.11 notice, with the Frishle Friction Clusteh attached, with or without boilers. This clutch has proved to be the test in the world for this work. It can be so adjusted that it will do a small amount of work, and from that up to the full power of engine, with no risk of breaking ropes, gearing or engine, a feature which no other friction com-

MACHINE MOLDED

From 1 to 20 feet

Diameter.



SHAFTING. **PULLEYS**

AND

HANCERS

A Specialty.

AND

SHEARS.

All sizes, from \$25 to \$300

Peerless Punch &

Shear Co.,

POOLE & HUNT, BALTIMORE, MD.



WICKERSHAM & CO., RAILWAY, MINERS', MILL & MACHINISTS' SUPPLIES.

W. & Co.'s Packing: Steam, Hydraulic and Locomotive. Samples sent free.
Lubricants for Engines, Shafting, &c.; Rolling Mill, Railroad, Gear and Axle Grease.
Also, Star Cylinder Oils,

No. 309 Race Street, Philadelphia, Pa. No. 232-LAKE STREET, Chicago, Ill.



New Upright Power Drill Presses. No. 3 swings 21 inches; backgeared, quick return. A strong fron brace extends from base to head of column—a new feeture. Weight, 1100 lbs.; hight, 6 feet. Price, \$210.

No. 1%, on legs, swings 13% inches, 4 speeds. Price, \$85.

No. 1 size, to set on bench, swings 13 inches, lever feed, 3 speeds, tight and loose pulleys. Price, \$35.

Peerless Punch & Shear Co.,

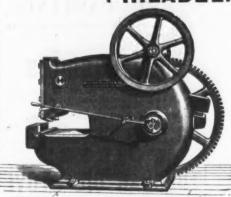
Street, New York

WE CHALLENGE THE WORLD FOR ITS EQUAL. eapest, most durable and effective Tool for Cleaning Tubes Hot or Cold. RUFFNER & DUNN, Schuylkill Falls, Philadelphia, Pa Patentees and Fole Manufacturers of the Excelsion STEEL TUBE CLEARERS. Most liberal discount to deal ora. Sense for Circulars



Machinery, &c.

& CO.,



Iron & Steel Working Machinery, MACHINISTS' TOOLS,

SHAFTING, GEARING &c., INJECTORS.

Shearing Machine. BRANCH OFFICE, 79 Liberty Street, New York.

SOUTHWARK FOUNDRY & MACHINE CO.,

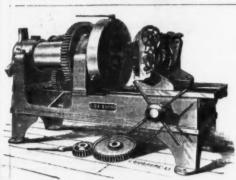
430 Washington Ave., PHILA., PA.,

ENGINEERS AND MACHINISTS.

BLOWING ENGINES AND HYDRAULIC MACHINERY.

SOLE MAKERS OF THE

PORTER-ALLEN AUTOMATIC CUT-OFF STEAM ENGINE.



Machines for Threading and Cutting off Pipe from one-eighth inch to twelve inches diameter. Hand Screwing Machines oneeighth inch to two inches.

COX & SONS, 204 N. 4th St.,

PHILADELPHIA, PA.



IMPROVED RADIAL DRILL

JONES. WILMINGTON, DELAWARE,

For Fitting Up Steam Engine Cylinders, Steam Chests, Bed Plates, &c.

The radiating-arm traverses freely in all directions, carrying drill, spindle and gearing backward and forward by rack and pinion and hand-wheels. The arm can be placed in any position, radiating from column as a center, placed in any position, radiating from column as a center, enabling a large number of holes to be drilled in succession on the same surface without moving the work. Each machine is double back-geared, with automatic feed motion. Extension base plate is planed off true and slotted. Four sizes.

W. C. WREN'S PATENT GRATE BAR.



DAVID S. CRESWELL, Manufacturer, PHILADELPHIA, PA. 816 Race Street, The most durable Grate Bar on the market.

HARRISON BOILER.

BOILER MADE OF

SPHERES MUST



STRENGTH WITH MOST HEATING SURFACE.

> Send for CIRCULAR.

Machinery, &c.



ENGINEERS, MACHINISTS, IRON FOUNDERS BOILER MAKERS G ROBT. WETHERILL & CO. Chester, Pa. STOW FLEXIBLE SHAFT CO., Limited

> 15th & Pennsylvania Ave. PHILADELPHIA, PA., Manufacturers of Portable Drifling, Tap ping, Reaming and Boring Machines. Also, Tools for Enery Wheel Grinding, Metal & Wood Polishing. Cattle Brushing & Cl. pping, &c. General Euro-pean Agenta BOLLING & LOWE, 2 Law

CHARLES W. ERVIEN & CO., Engine Builders, Boiler Makers and GENERAL MACHINISTS,

IRELAND STREET, PHILADELPHIA. PHILA. SHAFTING WORKS.



GEO. V. CRESSON, 18th & Hamilton Sts. PHILADELPHIA. SHAFTING A SPECIALTY. Manufacturers of hafting, Pulleys. Hangers, Coupli



ISRAEL H. JOHNSON, Jr., & CO., Tool and Machine Works,

Manufacturers of
ENGINE, BRASS FINISHERS', WOOD TURNERS',
AMATEURS' and JEWELERS' LATHES.
Slide Rest, Screw Machines, Terrot Heads, Serew
Presses, Scrow Clamps, Lathe Carriers, &c. 1422, 1424 & 1426 Callowhill Street, Philadelphia, Pa. Israel H. Johnson, Jr. Joshua R. Johnson, Jr.

Established 1867. Edwin Harrington & Son,
MANUFACTURER OF
PATENT EXTENSION AND
SCREW CUTTING LATHES Iron Planers. Radial, Upright, Suspension Multiple and Lever DRILLS, and a variety of other MACHINISTS' TOOLS Patent Double Chain Screve Pulley Blocks,

Unrivalled for Durability, Safe Patent Double Chain Quick-Lift Hoists, Brake for o Joweying.

Circulars turning.

WORES AND OFFICE.

COr. N. 15th and Fenna. Ave.,
Philadelphia. Pa., U. S. Av.,
Philadelphia. Pa., U. S. Av.,
Represented by J. Q. May.

NARD. 97 Liberty Street, N. Y.,
C. E. Kimball. 197 High 5.,
Eoston, W. H. RICKEY, 116 Main

84, Cincinnati.

E. L. HARRINGTON,



G. E. BRETTELL, Furnace St., Planers a Specialty, 26x26, 30x26 and 30x36



TUBAL SMELTING WORKS, STANLEY G. FLAGG & CO.

760 & 762 Broad Street, PHILADELPHIA.

PAUL S. REEVES.

GENUINE BABBIT

ANTI-FRICTION METALS.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND, PHILADELPHIA,

P. G. Address: MANUFACTURERS OF ALL EINDS OF

"Brewster Side-Bar Combination Patented" Springs and Timken's Patent Cross Springs,

Reiff's Patent, Groot's Patent, Carter's Patent and Saladee's Patent Crescent Spring,

SWEDISH STOCK, OIL-TEMPERED and WARRANTED. Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL. CAST SHOVEL, HOE AND MACHINERY STEEL

OXFORD TOR, SLEIGH, TIRE AND SPRING STEEL. BESSEMER SHOVEL AND PLOW STEEL.

BESSEMBR MACHINERY AND CULTIVATOR STEEL

RE-ROLLED NORWAY SHAPES.

NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

FROM 1-4 TO 15,000 LBs. WEIGHT, True to pattern, sound and solid, of unequaled strength, coapbness and durability. An invaluable substitute for forgings, or for cast iron requiring three-fold strength. Gearing of all kinds, Shoes, Dies, Hammerheads, Crossheads for Locomotives, etc. 20,000 Crank Shafts and 1,000 Gear wheels of this Steel now running prove its superiority over other Steel Castings. CRANK SHAFTS, CROSSHEADS AND GEARING ARE SPECIALTIES. Castings of every description. Circulars and Price Lists free. Address

CHESTER STEEL CASTINGS CO.,

PITTSBURGH STEEL CASTING CO., 26th and Railroad Stroots, PITTSBURGH, PA.

Refined Bessemer Steel; § Improved Steel Castings Under Hainsworth's Patents.

We are now prepared to fill orders for refined BESSEMER BILLETS or BLOOMS any desired carbon and a uniform quality.

We would call attention of consumers to the fact that we use good material, and produce a steel concurred by competent judges equal to the best English or German spring and soft steels.

Having had twelve years' experience in the making of STELL CASTINGS, a are able to refer to our customers in all part of the United States and Canada as to the quality of ar work in this line. We make castings of steel practically free from blow-bles, as soft and easily orned as wrought iron, yet stiff, strong and durable, with a tensile strength of not less than 65,000 counds to the square inch. In short, our castings unite the qualities of steel and wrought iron.

Wheels, Pinions, Cranks, Dies, Hammer Heads, Engines and Machinery Castings of all secriptions. Eailroad Frogs and Crossings, Plowshares, Moldboards and Landsides.



Punching Presses. DIES AND OTHER TOOLS BREET METAL GOODS, DROP FORGINGS, &c.

Stiles & Parker Press Co.,



SLIDING

DOOR HANGER, MANUFACTURED BY

E. C. STEARNS & CO. SYRACUSE, N. Y.

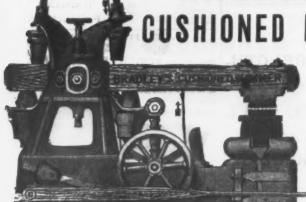
SALES OF

CHAS. HUMES & CO., ST. LOUIS MO.

1877. - - - 20 SETS. 1881, - - - - 500 SETS.

Send for Illustrated Catalogu





STANDS TO-DAY WITHOUT

AN EQUAL.

Over 800 in use.

Bradley & Co.

SYRACUSE, N. Y. (Established 1842.)

PHILADELPHIA, PA. Office and Works,

N. W. cor. 19th St. & Pennsylvania Ave. Manufacturers of

STEEL CASTINGS.

Substitute for Steel & Wrought Porgings.

Circulars sent on application.

Steel Castings.

RUREKA CAST STEEL CO., Office: 307 Wainut St., Phila.

"DIETZ"

'DIETZ" No. O TUBULAR REFLECTOR LANTERN.

WITH DASH ATTACHMENT. Throws a Powerful Light more than 100 feet.



56 Fulton Street. - -25 Lake St., CHICAGO.

TACKLE BLOCKS Rope and Iron Strap of all kinds. Ligmvitæ Wood for Ten-Pin Balls.

Wm. H. McMillan & Bro., Office, 118 South Street, New Yor ry. 39 to 40 Penn St., Brocklyn, E. D.



COLUMBIA BICYCLE. The Bicycle, as a permanent, practical road vehicle, is an acknowledged fact, and the thousands in daily use are constantly increasing in numbers. It combines speed and endurance that no horse can equal, and for pleasure or hearth is far superior to any other out-door sport. The art of riding is easily acquired, and the exercise is recommended by the medical prefeasion as a means of resiev.

THE POPE MEG. CO., 597 Washington st., Boston, Mar New York Riding School, 34 Street, near 3rd Avenue.

THE BEST IN USE.

This is the only scientifically constructed bucket in the market. It is struck out from charcoal stamping iron. "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great case and half the power of the old style bucket Will outwear half a dozen of them. Prices Reduced.

Warner's Patent T. F. ROWLAND, Sole Mfr., BROOKLYN, N. Y.

MICHIGAN BLOCK WORKS. Detroit, Mich., U. S. A.



Send for Catalogue and Price List.

BUFFALO SCALE CO. BUFFALO, N. Y.,

Manufacturers of

R. H. Track Scales, Hay Scales, Coal Scales, Grain Scales, Platform Scales, Counter Scales, &c. Send for price list, stating what you want.

NOTICE OF REMOVAL.

The Clayton Steam Pump and Air Compressor Works would respectfully announce that they will remove May is to their new works, 45 & 47 Nork S1., 43reklyn, N. Y. mear the approach to the New York and Brooklyn Bridge.

Scranton Brass Works. J. M. EVERHART,



CHIS Street, - - SCHANTON, PA.

BLACKSMITH DRILLS CLARK SINTZ & Co

RUSSELL, BURDSALL & WARD.

PORTCHESTER, N. Y.,

MANUFACTURERS OF

CARRIAGE, TIRE, PLOW, STOVE & OTHER BOLTS.

Carriage Bolts made from Best Square Iron a Specialty.

Green River Works,

Table and Pocket Cutlery,

BUTCHERS, HUNTERS', PAINTERS', DRUGGISTS' & HOUSEHOLD KNIVES

IN ALL STYLES AND VARIETIES.

OLDEST AND LARGEST AMERICAN MANUFACTURERS.

> Turners Falls, Mass

F. W. WURSTER, IRON FOUNDRY AND AXLE WORKS, 180 to 149 First St., Brooklyn, N. Y.

Factories.

SUPERIOR WAGON, CART AND CARRIAGE AXLES. Our facilities enable us to quote the trade lower prices than any other manufactory Send for price list

PAWTUCKET.R.I.

MANUFACTURER OF TAPS AND DIES.

"BOYNTON'S" UNRIVALED SOLID STEEL SAW SET.



E. M. BOYNTON SAW & FILE CO.

The only perfect set known: a blind man can use it by simply bringing han dies together. A perfect gauge, ad justed by a single thumb-serew; will set both points of a Lightning Buck Saw at once, and will set any saw from an ordinary hand saw to a 12 gauge mill saw. 10 in. Solid Steel, \$12 per doz.

No. 2 Size. \$10 per dez. 25 % discount. "BOYNTON'S PATENT LIGHTNING SAW SET AND FILE

COMBINED." 5 in., \$2.50. 8 in., \$5.50. 10 in., \$6.50. Less 40 x discount.

BOYNTON'S "PATENT LOOP" Cross Cut Saw Handles.

Per Dozen, 15 Cents Each. Per 100, Barreled, 12½ Cents Each.
Per 1000, Barreled, 10 Cents Each.
It has no rival: it is the best, the
eaviest, the strongest, and outselfs all

E. M. BOYNTON. 80 Beekman Street, NEW YORK.

LARGE

REDUCTION

IN PRICES OF



COAT AND HAT

MILES'

3-Inch, Coppered or Wainut Bronzed, Per Gross, - \$5.00

Discount to the Trade, 70 Per Cent. Other Sizes in Proportion.

F SEND FOR SAMPLES.

WAGONER &

MANUFACTURERS,

82 Beekman Street, NEW YORK.

WM. GILMOR of WM., BALTIMORE, MD., Washers. Rivets, Bolt Ends, Spikes, Wood Scre &s, Bolts, Nuts,

Track Bolts. BOILER AND BRIDGE RIVETS. Carry stock with New York Agents, LOVEJOY & DRAKE, 1c1 Reade Str.

the flan itself. and to given t low he which wholly rail is t In this greater the rail when th

the high and iron thick low of fitain whith are

ical Geri

upon iron macl

to th

ing is

the b

44 Car a mad

some ical de

speak; be do far br

in its

straig fixture

It is wrail, coper cemore stical wand to

the rail prop leaves t traction be the